



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>



EconP 10.4



Harvard College Library

FROM

Prof F W Jauszig





E con P 10.4



Harvard College Library

FROM

Prof. F. W. Jauszig









E conP 10.4



Harvard College Library

FROM

Prof F W. Jauszig









# AMERICAN ECONOMIC ASSOCIATION

Organized at Saratoga, September 9, 1885

## EX-PRESIDENTS

*FRANCIS A. WALKER, Massachusetts Inst. of Technology.	HENRY C. ADAMS, University of Michigan.
*CHARLES F. DUNBAR, Harvard University.	ARTHUR T. HADLEY, Yale University.
JOHN B. CLARK, Columbia University.	RICHARD T. ELY, University of Wisconsin.
EDWIN R. A. SELIGMAN, Columbia University.	

## OFFICERS FOR THE YEAR 1904

### *President.*

FRANK W. TAUSSIG,  
Harvard University.

### *Vice-Presidents.*

IRVING FISHER,  
Yale University.

JOHN H. GRAY,  
Northwestern University.

JOHN GRAHAM BROOKS,  
Cambridge, Mass.

### *Secretary and Treasurer.*

FRANK A. FETTER,  
Cornell University, Ithaca, N. Y.

### *Publication Committee.*

JACOB H. HOLLANDER, Chairman,  
Johns Hopkins University, Baltimore, Md.

THOMAS N. CARVER,  
Harvard University.

DAVIS R. DEWEY,  
Massachusetts Inst. of Technology.

DAVID KINLEY,  
University of Illinois.

WILLIAM A. SCOTT,  
University of Wisconsin.

HENRY R. SEAGER,  
Columbia University.

### *Executive Committee.*

#### *Ex-Officio Members—*

THE PRESIDENT

THE SECRETARY-TREASURER

THE CHAIRMAN PUBL. COM.

#### *Elected Members—*

WINTHROP M. DANIELS,  
Princeton University.

HENRY B. GARDNER,  
Brown University.

WILLIAM Z. RIPLEY,  
Harvard University.

Inquiries and other communications regarding membership, subscriptions, meetings, and the general affairs of the Association should be addressed to the Secretary of the American Economic Association, Cornell University, Ithaca, N. Y. Orders for publications should be addressed to The Macmillan Co., 65 Fifth Avenue, New York.

\* Deceased.

PUBLICATION  
OF THE  
AMERICAN ECONOMIC  
THIRD SERIES.  
VOL. V, NO. 3.

---

# MONOPOLISTIC COM

IN THE  
GERMAN COAL  
BY

FRANCIS WALKER

---

AUGUST, 190

---

PUBLISHED FOR THE  
AMERICAN ECONOMIC ASSOCIATION  
BY THE MACMILLAN COMPANY  
NEW YORK  
LONDON: SWAN SONNENSCHNEIDER

Harvard College Library  
June 12, 1914  
Gift of  
Prof. F. W. Taussig  
Cambridge

EconProc

BOUND APR 13 1915

Copyright, 1904, by  
AMERICAN ECONOMIC ASSOCIATION

PRESS OF  
ANDRUS & CHURCH  
ITHACA, N. Y.

## PREFACE

The present study of the coal combinations in Germany was made by the writer during a recent sojourn in that country (1902-3). The immediate incentive was the desire to observe more closely the particular development of the world-wide movement of combination. The desire was stimulated by the fact that an extensive investigation of the subject was initiated at that time by the Imperial Government. A general survey of a considerable part of the German literature on the subject convinced the writer that at present the scientific need was in the direction of special rather than general studies. There already exist a number of very intelligent general treatises, such as those of Liefmann, Pohle and Grunzel, and any further general discussion of the subject could scarcely be more than a repetition or *réchauffé* of familiar propositions in either a controversial or an eclectic form. In certain branches of industry, notably in sugar and spirits, a considerable number of special treatises have been written, based on a close study of the business and technique, but, so far as the present writer knows, there has been nothing attempted in the most important and fundamental of all German cartelled industries, namely, mining and metallurgy, beyond magazine articles and pamphlets. The great amount of literary and statistical material respecting the coal industry, though widely scattered, makes the subject peculiarly suited to a more detailed analysis.

The writer has had the advantage of making two visits to Westphalia and another to Luxemburg (the principal coal and iron districts), and has also had the



opportunity of meeting and talking with some of the leaders in these industries. In this connection he wishes to express his special indebtedness and thanks to Herr Prof. von Halle of the University of Berlin and to Herr Director Dernburg, chairman of the Bank für Handel und Industrie and also chairman of the Deutsche-Luxemburgische Bergwerks- und Hütten A.G. The publication of the results of the recent government *Enquete* brought, of course, a large amount of new material for analysis, but the writer believes that much of that previously published has escaped the attention, or at least the practical utilization, of those who have written on this subject. Some of the most familiar material has been erroneously used.<sup>1</sup> In regard to the statistical material itself, a possible question might arise as to its reliability. A large part of it comes necessarily from the producers themselves (including official government statistics), and is beyond any direct means of control. Nevertheless indirect means of control are frequent, and tend to confirm such figures, while in instructed circles their honesty does not seem to be questioned. This also is the position of the writer, who has given them full faith and credit, as due to the *Treu und Glauben* which the German business man claims as his preëminent virtues.

FRANCIS WALKER.

*New York*, Dec. 23, 1903.

<sup>1</sup> The Prussian Minister of Trade and Industry and Herr Calwer, a well known economic writer, have used certain official statistics as figures of price when they are really figures of cost. (See p. 153).

# CONTENTS

---

PREFACE .....	Page iii
---------------	----------

## MAP

INTRODUCTION .....	Page i
--------------------	--------

## PART I. GENERAL ASPECTS OF THE COAL INDUSTRY

CHAPTER I. COAL SUPPLY.....	Page 5
-----------------------------	--------

Coal deposits of Germany, p. 5. Kinds of coal produced, p. 8  
Manufactures of coal, coke, briquets, etc., p. 11.

CHAPTER II. MARKETS.....	Page 12
--------------------------	---------

Coal consumers, p. 12. Local Markets, p. 13. National competitive markets, p. 15. International markets, exports and imports, p. 19.

CHAPTER III. TRANSPORTATION .....	Page 24
-----------------------------------	---------

Cost of transportation and delimitation of markets, p. 24. Water transportation facilities, p. 25. Railways, p. 25. Costs of transportation to important markets, p. 28.

CHAPTER IV. CAPITAL, ORGANIZATION AND LABOR ....	Page 30
--------------------------------------------------	---------

Estimate of value of coal properties in 1902, p. 30. Capitalistic form of industry, p. 32. Mining Law, p. 33. Organization of companies, p. 33. Labor supply, p. 35.

## PART II. HISTORY OF COAL COMBINATIONS

CHAPTER I. HISTORY OF THE COMBINATIONS IN THE RUHR BEFORE THE SYNDICATES .....	Page 38
-----------------------------------------------------------------------------------	---------

Early history of the coal industry, p. 38. Cause of cartell movement, p. 39. History of early cartells, p. 40. Formation of the coal and coke syndicates, p. 49.

CHAPTER II. OTHER COAL CARTELS.....	Page 50
-------------------------------------	---------

Organization of coal interests in other districts, p. 50.

CHAPTER III. HISTORY OF THE OPERATION OF THE COAL AND COKE SYNDICATES OF THE RUHR .....	Page 53
--------------------------------------------------------------------------------------------	---------

Operations of the coke syndicate, 1890-1895, p. 53. Beginnings of the coal syndicate, 1893-1895, p. 56. Operations of the coal and coke syndicates during the *Hausse*, 1895-1900, p. 59. The coal famine and the crisis, 1900, p. 65. The coal and coke syndicates during the hard times, 1901-1902, p. 72.

### PART III. INTERNAL ORGANIZATION AND POLICY OF THE COAL AND COKE CARTELLS

#### CHAPTER I. THE RHENISH-WESTPHALIAN COAL AND COKE SYNDICATES ..... Page 78

Analysis of the constitution of the coal syndicate, p. 78. Constitution of the coke syndicate, p. 85. Treaty of the coke syndicate with the Belgian syndicate, p. 89. Operation of the cartell constitutions and the internal policy of the cartells, p. 90. The movement for reorganization, p. 100. The new constitution, p. 103. Recent developments, p. 109.

#### CHAPTER II. THE COAL CONVENTION OF UPPER SILESIA. .... Page 112

Analysis of the cartell constitution of the convention, p. 112.

### PART IV. ANALYSIS OF THE OPERATION OF THE COAL AND COKE CARTELLS

#### CHAPTER I. PRODUCTION OF COAL ..... Page 121

Quantity of production, p. 121. Cartelled and non-cartelled production, p. 121. Consumption, p. 123. Regulation of production, p. 126. Technical control of the output, p. 127. Apportionment and limitation of the output, p. 128. Economy of production, large and small concerns, cartells, p. 138. Relation of cartells to technical progress, p. 141. Preservation or elimination of poor mines, p. 142. Quality of coal, p. 143.

#### CHAPTER II. COST OF PRODUCTION OF COAL ..... Page 145

Relation of the various elements of cost to the progress of mining, p. 145. Technique, p. 146. Depth and richness of deposits, p. 147. Wages, p. 149. Materials, p. 149. Public burdens, p. 150. Estimates of average cost of production in the Ruhr, p. 152. Margin of cost, p. 156. Costs in other districts, p. 158.

#### CHAPTER III. PRODUCTION AND COST OF PRODUCTION OF COKE ..... Page 160

Production and consumption of coke, p. 160. Technical conditions of production, p. 164. Apportionment and limitation of output, p. 165. Economy of production, large and small concerns, the syndicate, p. 168. Quality of coke, p. 169. Cost of production of coke, p. 171. Estimate of cost on basis of average cost of coal, p. 172. Relation of by-products to cost, p. 173.

#### CHAPTER IV. PRICE POLICY IN GENERAL ..... Page 175

Prices and proceeds, p. 175. General price history in the Ruhr, p. 180. In Upper Silesia, p. 184. In the Saar, p. 187. In Lower

Silesia, p. 190. Price policy of outsiders, p. 191. Price movement of coke in the Ruhr, p. 192. Coke prices of outsiders in the Ruhr, p. 196. Comparison of the coke prices of the Ruhr and the Saar, p. 196. Prices in Germany compared with other European countries, p. 197. Prices in competitive districts in Germany, p. 202.

**CHAPTER V. EXPORT PRICES AND EXPORT BOUNTIES** Page 208

Low export prices and their economic significance, p. 208. Policy of the coal syndicate, p. 211. Of the coke syndicate, p. 214. Extent of low export prices tested by proceeds, p. 216. Export bounties, p. 219. Development of the bounty policy in the Ruhr, p. 220. Amount of bounties and extent of low export prices tested by assessments (Umlage), p. 225. Criticism of bounty policy, p. 228.

**CHAPTER VI. EFFECT OF PRICE POLICY ON INDUSTRY** Page 230

Relation of coal prices to the industry under the cartell régime, p. 230. Comparison of price movements of coal and iron, p. 231. Element of coal cost in iron manufactures, p. 233. Question of cause of crisis in German iron industry, p. 234. Profits and stock quotations of iron concerns, p. 238. Relation of coal prices to textile, sugar, cement, lime, transportation and other industries, p. 244. Coal prices and the general consumer, p. 246.

**CHAPTER VII. PROCEEDS AND PROFITS**..... Page 247

Proceeds and profits a test of reasonable prices, p. 247. Analysis of proceeds per ton and estimates of profit therein for coal in the Ruhr, p. 247. Statistics of dividends and profits, p. 256. Depreciation accounts, p. 262. Proceeds in Upper Silesia, p. 263. Proceeds and profits in the Saar, p. 264. Proceeds for coke in the Ruhr, p. 264. Difficulty of measuring cost and profit, p. 268.

**CHAPTER VIII. ORGANIZATION OF SALE AND THE COAL**

**TRADE**..... Page 269

The syndicates as selling organizations, p. 269. Price differentials of the coal and coke cartells, p. 269. Regulation of the terms of sale, p. 271. The coal dealers, p. 278. Services and costs, p. 279. Exorbitant prices, p. 279. Attempt at control by the syndicate, p. 280. Present position of dealers, p. 282. Consumers' associations, p. 283. Significance of the movement, p. 283. Relations with the coal cartells, p. 284.

**CHAPTER IX. CONDITION OF LABOR UNDER THE CARTELL**

**RÉGIME**..... Page 290

No direct relations between the cartells and labor, p. 290. Course of wages, p. 290. Productivity of labor, p. 294. Wages in cartelled and non-cartelled concerns, p. 291. Regularity of employment, p. 297. Hours of labor, p. 299. Other conditions of work, p. 301. Effect on labor organizations and the independence of the laborer, p. 302. Strikes, p. 303.



243  
1-18

**PART V. REGULATION AND REFORM**

<b>CHAPTER I. PRESENT SITUATION.....</b>	<b>Page 304</b>
Status of German law respecting combination and monopoly, p. 304.	
Classification of methods, p. 305.	
<b>CHAPTER II. LEGAL REGULATION .....</b>	<b>Page 307</b>
Criminal law, p. 307. Civil law, p. 308. Administrative law, p. 308. Publicity, p. 308. Cartell bureau, p. 309. Limitation of dividends, p. 311. Price regulation, p. 311.	
<b>CHAPTER III. ECONOMIC REGULATION.....</b>	<b>Page 312</b>
Control through customs duties, p. 312. Railway rates, p. 314. Fiscal cartells, p. 316. Nationalization, p. 317. Self-help, p. 321.	
<b>CONCLUSION.....</b>	<b>Page 322</b>
<b>BIBLIOGRAPHICAL REFERENCES .....</b>	<b>Page 328</b>





2/15  
1-18

vi

Cl

Cl

Cl

p.  
di

C

F

C

B

## INTRODUCTION.

The problem of monopolistic combination is one of the most serious, perhaps the most serious, which confronts the student of economics at the present day. It is of world-wide significance, and it goes to the very roots of our social organization, demanding, possibly, a reconstruction of both the theory and the practice of our economic life. Variations of the same phenomena appear in every modern industrial state, namely the development of large business organizations, and in a greater or less degree, the substitution of monopoly for free competition. Industrial leaders and lawyers, statesmen and scientists have been compelled to face new problems the proper solution of which is of vital importance to the welfare of the individual and the state.

To meet this problem in a narrow spirit by the study of particular conditions or local experience would afford little hope of a wise solution or a successful policy. It would disregard, moreover, the fact that in some important phases the particular manifestations are international in scope and influence. The problem, therefore, must be studied as a world-problem, and the interest of each nation extends, or should extend, to the situation in other lands. For this reason, apart from all questions of purely scientific interest, the study of the monopolistic combinations in Germany, or cartells, as they are called there, is of real interest to other nations. The proper study of such a problem is not the occupation of an idle hour, nor are the opinions of superficial writers or their hasty generalizations of a vast number of very intricate phenomena over the

whole field of a nation's industry worthy of even such trivial attention. Unfortunately most of the writings on the subject are of this sort. On the other hand, there are some excellent general treatises on the subject, but their conclusions can not be regarded as final. Two things are lacking, first, a sufficient basis in the direction of detailed analysis, second, mature experience with the new economic institutions. The present study aims to contribute something toward supplying the first want by describing in detail the combinations, or cartells, in the German coal industry. The fact that their history covers a period of twenty-five years relieves it from the charge of being premature. Though the solution of the problem of monopolistic combination cannot be successfully obtained by the study of any one country, and *à fortiori*, any one industry, yet, the study of certain important cartells in detail is one of the most effective means of getting correct and vivid ideas of the real character of the problem.

Whether we consider its size, its industrial importance, or the ingenuity and perfection of its organization, there are few combinations in the world, and none in Europe, that equal or surpass the great coal cartell on the Rhine. What is equally important, and for the present purpose necessary, is that we are able to construct a remarkably clear record of its operations and of those of its rivals for a considerable term of years.

The fact that there are keen outsiders, and rival combinations in other parts of the Empire; the fact that there are important and intimate alliances with other cartells, both foreign and domestic; the fact that Germany is both an exporting and an importing country, and meets England in rivalry from the Baltic to the Mediterranean, (not to speak of other countries),

all give the problem a special interest and value. Of special interest, however, is the fact that the government (in particular the Prussian fiscus) is itself a great coal producer. The often advocated remedy for private monopoly, namely, nationalization is here put to a practical test in the most effective manner and under the most advantageous circumstances. We have therefore competition and monopoly, private ownership and state ownership in a great variety of phases. Another fact, of special interest to Americans, is that we have the opportunity of studying the growth of monopoly in a land where the railways are owned by the state, and, hence, where the combinations are unable to obtain abnormal nourishment and support from preferential rates or rebates.

It is proposed to examine the history, the organization and the practical operation of these combinations paying special attention to their policy in regard to production and price, the effect on other industries and their relations to the dealers and to labor and the problem of State control. The reader is warned that some questions which are of great importance, for example, in America are quite unimportant in Germany, and therefore receive little attention. This indeed is not the least valuable or instructive part of such a study, and helps to differentiate the accidental from the substantial features of the problem.



## PART I

### GENERAL ASPECTS OF THE COAL INDUSTRY

#### CHAPTER I

##### COAL SUPPLY

Germany stands second in Europe with respect to coal supply, with England first and France third. According to recent estimates of Nasse, Lexis and others, the chief ascertained sources of supply are, in Europe, United Kingdom 198 billion tons, Germany 112 billion tons, France 18 billion tons, Russia 17 billion tons, Belgium 15 billion tons, etc. The United States is put at 684 billion tons, and China, it is thought, may have an equally great supply. Australia is put at 240 billion tons.<sup>1</sup>

The coal deposits of Germany lie chiefly in three districts, all of which are situated in Prussia. The largest, according to the usual estimates, is in Westphalia and the Rhine province, mostly on the right bank of the Rhine, north of the river Ruhr. It is generally called the Ruhr district. The second most important district lies in Upper Silesia and laps over into the contiguous empires of Austria and Russia. About three-fourths of the coal is in Silesia.<sup>2</sup> The third important deposit is in the extreme southwestern end of the Rhine province and runs across into Lorraine and the Bavarian Palatinate. It takes its name from the river Saar which runs

<sup>1</sup> Lexis, p. 1077-8; Renauld, p. 43; *Oesterr. Zeitschr, B. f. u. H.*, 1902, p. 426. These statistics are incomplete as well as largely conjectural.

<sup>2</sup> Renauld, p. 39; one-fifth in Austria.



through it. Coming now to the smaller coal fields, we have, first, the Wurm or Aachen district, which also lies in the Rhine province on the border of Belgium, second, the Lower Silesian or Waldenburg district, in the north-western part of the province of Silesia and near the Bohemian border, third, the Zwickau district in the kingdom of Saxony. According to Nasse, the estimated available stocks in these districts are as follows: the Ruhr, 50.0 billion tons, Upper Silesia, 45.0 billion tons, the Saar, 10.4 billion tons, Aachen, 1.8 billion tons, Lower Silesia, 1.0 billion tons, Saxony, .4 billion tons, and for the rest of Germany, .4 million tons, giving a total of 109.0 billions.<sup>1</sup> Besides Steinkohle, or coal proper, there are considerable deposits of Braunkohlen, or lignite, lying chiefly in central Germany, in Prussia, (provinces of Saxony and Hannover and in the Rhine province near Cologne), Anhalt, Sachsen-Altenburg, Brunswick and the kingdom of Saxony. Lexis reckons these deposits at about five billion tons which is equivalent to perhaps three billion tons of Steinkohlen.<sup>2</sup> The

<sup>1</sup>Quoted by Renauld, p. 42. These estimates vary greatly. Bergrath Grassmann recently stated there were 54.3 billion tons in the Ruhr at a depth of 1500 meters. *Stahl u. Eisen*, 1902, p. 846. A recent estimate for Upper Silesia was as follows: At 1000 m., 62.8 billion tons; at 1500 m., 101.55 billion tons, and at 2000 m., 140.8 billion tons. *Stahl u. Eisen*, 1901, p. 1063.

<sup>2</sup>Lexis, pp. 1077-8, 1081. Another way to get an idea of the available supply, as well as the nature of the mining problem, is to find the area of the field and the number and richness of the seams. The following table gives a rough idea of the facts.

District.	Area Sq. Km.	Seams Workable.	Total Thickness.
Ruhr .....	2800	65	65.4 m
Upper Silesia .....	450	104	154.8 m
Saar.....	385	82	77.6 m
Lower Silesia .....	200	16	---
Saxony.....	220	9	---
Aachen .....	21	28	---

Koepper, 24-5; Lueger, p. 676.

Ruhr has seams of moderate thickness and accessibility. The deep shafts are about 700 meters, generally. Upper Silesia has seams of extraordinary thickness and accessibility. Renauld says there are usually from four to six meters of pure coal, and often nine to twelve meters, while the average depth is from 200 to 300 meters.<sup>1</sup> The mines of the Saar appear to be rich, but deep, difficult, and dangerous.

Of more immediate interest are the statistics of production. According to a recent estimate the total production of the world in 1901 was 789,128,476 tons (metric). The principal producing countries and their respective shares are shown in the following table.<sup>2</sup>

British Empire.....	244,463,996 tons.
United Kingdom.....	222,562,125 "
Canada.....	5,612,108 "
India.....	6,742,214 "
Germany.....	153,019,414 "
Austria-Hungary.....	40,757,895 "
France.....	32,325,302 "
Belgium.....	23,462,817 "
Russia.....	16,151,557 "
Spain.....	2,747,724 "
Japan.....	7,429,457 "
United States.....	266,151,103 "

About two-thirds of the Austro-Hungarian and one-third of the German production was of brown coal or lignite.

The production of Steinkohlen for the various parts of the German Empire for 1902 is given in the following table.

District of Breslau.....	29,055,054 tons.
" Halle.....	9,882 "
" Klausthal.....	684,092 "
" Dortmund.....	58,038,594 "
" Bonn.....	12,327,693 "
Total..... Prussia.....	100,115,315 "
Bavaria.....	1,233,569 "
Saxony.....	4,611,500 "
Alsace-Lorraine.....	1,309,818 "
Rest of Empire.....	166,132 "
Total Empire.....	107,436,334 "

<sup>1</sup> Renauld, 38-41.

<sup>2</sup> *Oesterr. Zeitschr. B.u.H.*, 1903, p. 347.

The production of brown coal was 43,000,476 tons which would give a grand total of 150,436,810 tons.<sup>1</sup> In explanation of the above table it is sufficient to say that the Ruhr district is embraced in the Dortmund district, the output of Upper and Lower Silesia under Breslau, the Saar and Aachen output under Bonn, and the production of Zwickau under Saxony.

Coal as an article of commerce has a great many varieties which are adapted to different uses and command widely different prices. The differences in kind depend first, on the physical and chemical qualities of the coal, and, secondly, on the size or mixture of sizes. An idea of the extent to which this classification is carried as a matter of practical business may be gathered from the fact that the list of standard prices of the Rhenish-Westphalian coal syndicate contains 108 different assortments, depending on quality, size, refinement and mixture, and that the prices of the same may vary from 4 marks to 22.50 marks per ton.<sup>2</sup> If the different brands, as well as the different sorts, are counted the number exceeds perhaps 1400.<sup>3</sup>

The classification of coal depends chiefly on the chemical composition, that is, the relative amounts of hydrogen, oxygen, and sulphur, combined with the carbon. The outward evidence appears chiefly in the flame, the greasiness, and hardness, and the character

<sup>1</sup> *Vierteljahrshefte z. Statistik d. Deutschen Reichs*, 1903, II, pp. 102-3. Of the brown coal, 36,122,147 tons were produced in Prussia, of which 29,127,798 came from the mining district of Halle (principally Province of Saxony), and 5,461,373 tons from the mining district of Bonn. Saxony produced 1,726,970 tons, Brunswick 1,307,867 tons, Anhalt 1,278,112 tons, and Sachsen-Altenburg 2,181,661 tons.

<sup>2</sup> Enquete, p. 282-4; table of prices given.

<sup>3</sup> *Cent. Verband, D. I.* 1901, p. 244.

of the ashes, etc. In the terminology of the Ruhr the principal kinds are as follows:<sup>1</sup>

Langflammige Kohle (long flame coal)	{ 1. Trocken (dry).
	{ 2. Gas and Gasflamm, Fett (greasy).
Kurzflammige Kohle (short flame coal)	{ 3. Fett or Schmiede (forge).
	{ 4. Halbfett (half greasy) or Ess (draft).
	{ 5. Mager (lean) and Anthracit.

'The first—dry coal with a long flame—is a hard lively burning coal adapted to boiler firing as its ashes do not encumber the grate. The second—greasy coal with a long flame—is the gas coal *par excellence*, because, besides furnishing gas richly, it cokes well, giving a valuable by-product. It is also used in industry, in puddling furnaces and as a house fuel. As the coke made from it contains sulphur, it is not adapted to metallurgical uses. The third—greasy coal with a short flame—is the real Fettkohle which is a fine steam and coke coal. It bakes together well when coked and can stand the pressure in a blast-furnace, while it is very free from sulphur or other injurious constituents. The fourth—half-greasy coal with a short flame—requires a strong draft; it burns with little smoke and is suitable for cities. The fifth—lean and anthracite—was formerly much despised in Germany, but now some of the best varieties, *i. e.*, anthracite, command high prices. It is the purest in carbon, but does not burn easily. The Mager coal is used in the Ruhr district chiefly in brick and lime-kilns.<sup>2</sup>

Brown coal, or lignite, is sharply distinguished from Steinkohle, both as a substance and as a commodity, and does not specially interest us here.<sup>4</sup>

<sup>1</sup>Koepper, p. 46.

<sup>2</sup>Koepper, pp. 46-8; Steinkohlenzechen, pp. 81-3.

<sup>3</sup>It belongs to a different geological era, and often looks more like earth than coal. It has, indeed, a very low percentage of carbon, and hence low heating power.

Of the various kinds of Steinkohlen, all those described above appear in large quantities in the Ruhr, but it is particularly rich in the most desirable kind, viz., Fettkohle.<sup>1</sup> The Saar coal is largely of the long flame variety; the Aachen coal, on the other hand, is mostly short flame;<sup>2</sup> while the Upper Silesian coal is largely gas coal.<sup>3</sup>

The variations of size in coals results from the methods of getting it out, from the physical consistency of the coal, and from the various processes of refinement. A great deal of coal is used just as it comes out of the mine, though less so than formerly; this is called Förderkohle (run of the mine). Coal is also refined on a very extensive scale, and different grades and sizes are sometimes subsequently mixed again, especially for fine steaming qualities. For large pieces, the separation is made by hand, but for the smaller sized coal by mechanical processes, dry or wet. The former is accomplished by jigs and screens; the latter applies water also, which facilitates the separation of the slate and bone owing to their greater specific gravity, and cleanses the coal of dirt. The names and measurements of the different sizes vary, but the following may be taken as characteristic.<sup>4</sup>

Stück.....	Over 80 mm.
Würfel.....	80-40 mm.
Nuss.....	40-15 mm.
Grus.....	15- 8 mm.
Staub or Fein.....	Under 8 mm.

<sup>1</sup> The production of the Ruhr syndicate, which includes most of the output of the district, shows the following distribution in 1902: Fett, 59.37 per cent; Gas and Gasflamm, 28.62 per cent; Ess and Mager, 12.01 per cent. Bericht d. Kohlen Syndicat, 1902.

<sup>2</sup> Koepper, p. 44.

<sup>3</sup> Renauld, p. 41.

<sup>4</sup> Lueger, p. 677.

The most important product in the manufacture of raw coal is coke. The distillation of coal produces coke, gas, tar, ammonia, benzol, etc. At coal mining works coke is the chief product and gas is a by-product generally consumed in the heating of the coke furnaces or for other similar purposes. When the coke is drawn out of the retorts or ovens, it is cooled quickly with water, and appears for the most part in large tough pieces suitable for the blast furnace. The coke is also sized, and, according to its size, strength and purity, it is used for different purposes, such as smelting, forging, steaming, house-heating, etc. The ammonia is mostly converted into a sulphate, and used as a fertilizer.

Another important manufacture of the coal industry are Brikets. These are bricks, ellipsoids, etc., made either from Steinkohle or Braunkohle, which must be reduced to a fine size, and cleansed of impurities, and then pressed into shape, and cemented together with tar or some cohesive substance. Braunkohle is so impure that, without this process of refinement, it would not be applicable to many uses, nor worth distant transportation. But Brikets from Steinkohle have distinct advantages also which, according to Lueger, are, (1) non-changeability of substance, (2) uniformity of quality, (3) facility for storage, (4) easy combustion, (5) little smoke. They are used in Germany with great success both in industry (*e.g.*, locomotives) and for house-fuel.<sup>1</sup>

<sup>1</sup> Lueger, pp. 679-80; Steinkohlenzechen, pp. 84-5.

## CHAPTER II

### MARKETS

The chief conditions determining the market of coal are: (1) climate, (2) population, (3) industrial development, and (4) cost of transportation. The last circumstance tends to limit the area of sale and to concentrate or confine large coal-using industries to the neighborhood of the source of supply. But a cheap labor supply is more important for some industries than cheap coal, and, especially in older communities, it may be more practicable to transport the coal than the labor power. Of course in a northern country the use for house-fuel is of great importance; there is also need of coal for gas production; here the market depends chiefly on the density of population. The following table of the consumptive uses of coal produced in the fiscal mines of the Saar in 1899 (over 9,000,000 tons) is probably a fair example of the situation in Germany.<sup>1</sup>

Iron industry (including coke coal) .....	28.04 per cent
Railroads .....	9.82 "
Gasworks .....	9.18 "
Textile industry .....	3.20 "
Chemical factories .....	2.81 "
Glass industry .....	2.52 "
Salt works .....	0.38 "
Sugar factories .....	0.66 "
Porcelain, stoneware, etc. ....	2.44 "
Machine factories .....	1.26 "
Cement factories .....	1.22 "
Paper factories .....	.82 "
Other industries .....	.82 "
Commerce and house fuel .....	26.22 "
Consumed in coal mines .....	10.61 "

It will be observed that the iron industry alone takes one-fourth, and other industries (not including gas) take

<sup>1</sup>Bericht d. X Commission, pp. 11-12.

about one-sixth. A part of that designated commerce and house-fuel is undoubtedly sold for industrial purposes abroad, so that gas and house-fuel account for less than one-third. A record for the consumption of the Ruhr coal would undoubtedly show a relatively greater industrial consumption, while the element of house-fuel would be more important probably in Upper Silesia (Berlin market).<sup>1</sup>

The market for coal may be divided into three parts: (1) local, (2) national, and (3) foreign. Each has its peculiar character and conditions.

The local markets in the principal coal producing regions of Germany are, of course, chiefly industrial, as they are the seats of those industries in which coal is an important factor in the cost of production. This is especially the case of the iron trade. Industry has been forced to a large extent to establish itself where the coal is mined and at points often ill-situated for the marketing of the commodities produced. In the course of time these regions become great centres of population, and then the local market becomes the richest as well as the nearest. This is well illustrated by the situation of the Rhine province and Westphalia in the region of the Ruhr. The Ruhr district in 1895 (3600 sq. km.) had a population of 2,400,000 or 656 per sq. km; the population per sq. km. for the Empire in 1895 was 96.7. The railway freight shipments of the Ruhr district were 73,000 tons per km. of railway, compared with 8,500 tons per km. for the Empire, etc.<sup>2</sup> The Rhine province and Westphalia are the most populous of the larger districts of Germany next to Saxony.<sup>3</sup> In the iron indus-

<sup>1</sup> Cf. Renauld, p. 76; Aeltesten d. Kaufmannschaft, 1901, II, p. 15.

<sup>2</sup> Sympher, p. 23.

<sup>3</sup> *Statistisches Jahrb. f. d. Deutsche Reich*, 1902.



try it is often a question whether to take the coal to the iron mine, or the ore to the coal mine, a problem, that here as elsewhere, is solved both ways; coke is sent from the Ruhr to Siegerland, Lorraine and Luxemburg, and, *vice versa*, the iron ore of Siegerland, Lorraine and Luxemburg is hauled to the coal region to make up its great deficiencies in ore supply.<sup>1</sup>

Considering the large development of industry and the density of population in the Ruhr district, it is not surprising that half of the total coal production is consumed there.<sup>2</sup> In Upper Silesia, the immediate locality has no such development as the Ruhr and requires only one-fifth of the production. The Province of Silesia, however, consumed nearly one-half.<sup>3</sup> In Lower

<sup>1</sup> The location of the raw iron production of the Zollverein in 1900 was as follows:

Rhineland and Westphalia (excl. Saar and Siegerland) .....	3,270,373 tons.
Siegerland and Lahn .....	739,895 "
Silesia and Pomerania .....	847,648 "
Kingdom of Saxony .....	25,598 "
Hannover and Brunswick .....	344,012 "
Bavaria, Württemberg and Thuringia .....	143,777 "
Saar, Lorraine and Luxemburg .....	3,051,539 "
Total .....	8,422,842 "

*Glückauf*, 1901, p. 242.

<sup>2</sup> Cf., Sympher, Anlage, 9. In 1901 the consumption of the Ruhr district proper (both Rhenish and Westphalian) amounted to almost exactly 50%; the shipments outside the district were 29,116,051 tons; the production of the district was 59,004,609 tons, leaving a local consumption of 29,888,558 tons. (Shipments calculated from data of van der Borcht, *Conrad's Jahrb.*, 1903, III, pp. 187-8; production from Bericht d. Kohlen Syndicats, 1902.)

<sup>3</sup> The total production in 1902 was 24,443,100 tons: 18.43% were consumed in smelters and coke works of the locality, and nearly 3% more for all other purposes; 17,068,290 tons were shipped by main railways (including a trifling amount of coke and briquets), and of this quantity 6,502,813 (26.6%) was destined to points in Silesia, giving a total consumption for the province of 11,736,144 tons (48%). Statistics taken or compiled from Statistik d. Oberschles. B. u. H. Ver., 1902, p. 62-3.

Silesia, of a total production in 1900 of 3,677,000 t., 1,386,000 tons was consumed in the district, and 957,000 elsewhere in Germany.<sup>1</sup> The question of the extent and importance of the local (monopoly) market is one of the most important facts to be determined in the analysis of the cartell system. Competition from outside regions under normal conditions is a negligible quantity.

The general or national market, on the other hand, is characterized by an absence of exclusive supply from any one source. This is most readily seen by taking the coal consumption of large cities removed from the sources of supply. Berlin is the most important example, and its sources of supply may be seen from the following table.<sup>2</sup>

	<i>Tons.</i>
English coal, coke and briquets .....	410,327
Westphalian coal, coke and briquets .....	239,323
Saxon " " " .....	18,355
Upper Silesian " " " .....	1,681,325
Lower Silesian " " " .....	339,671
<hr/>	
Total coal, coke and briquets .....	2,689,001
Bohemian brown coal and briquets .....	35,692
Prussian and Saxon brown coal and briquets .....	1,284,036
<hr/>	
Total brown coal and briquets .....	1,319,728
<hr/>	
Grand total, fuel of all kinds .....	4,008,729

Although Upper Silesia holds a leading position, the English and Westphalian producers supply a considerable portion, while the Saxon and Prussian briquets are even more redoubtable competitors. Munich shows an equally independent situation; her chief sources of coal supply are from the Palatinate and from the Ruhr, but the Saar and Austria furnish a respectable portion, while the latter furnishes a large supply of briquets.<sup>3</sup>

<sup>1</sup> Friedrich, p. 62; *cf.*, Sympher, p. 133.

<sup>2</sup> Statistik. Oberschl. B.-u.-H., 1902, p. 67.

<sup>3</sup> Railway receipts at Munich, 1902.

<i>Origin.</i>	<i>Steinkohlen. Tons.</i>	<i>Braunkohlen. Tons.</i>
Bavaria, Palatinate .....	285,768	95
Rhineland and Westphalia .....	163,603	---
Silesia .....	7,021	---
Province of Saxony .....	1,566	1,635
Saar .....	37,540	---
Kingdom of Saxony .....	3,311	2,024
Other German .....	1,704	---
Austria-Hungary .....	22,616	157,387
Great Britain .....	505	---
Other foreign .....	95	---
	<hr/> 523,729	<hr/> 161,141

Steinkohlenzechen, p. 119.

An examination of the figures of consumption of Leipzig would show the same general facts on a smaller scale, with a preponderance of brown coal in the ratio of more than 3 : 1.<sup>1</sup>

An examination of the domestic market requires something more than a view of the consumption of the cities, and we find that the different producing regions have a wide area of sale that overlap in many districts. The situation is clearly shown in the following tables for the principal regions. In 1899 the distribution of Ruhr coal in the domestic market was as follows :<sup>2</sup>

	<i>Tons.</i>
Westphalia and Rhine Province .....	27,519,441
Hannover and Brunswick .....	2,220,909
Magdeburg and Province of Saxony .....	624,789
Berlin and Province of Brandenburg .....	199,794
Thuringia and Kingdom of Saxony .....	488,820
Frankfurt and Hessen-Nassau .....	1,484,590
Bremen, Oldenburg and East Friesland .....	1,080,046
Hamburg, Schleswig-Holstein and Jutland .....	1,484,615
Lübeck, Mecklenburg and Danish Islands .....	196,706
Bavaria, Baden and Württemberg .....	777,569
Alsace and Lorraine .....	93,112
Total domestic .....	<hr/> 36,170,391
Total (excluding Rhineland and Westphalia) ..	8,660,950

<sup>1</sup>The principal sources of supply for Leipzig in 1902 were: Steinkohlen—Westphalia, 32,237 tons; Silesia, 71,491 tons; Saxony, 109,843 tons. Braunkohlen—Kingdom of Saxony, 214,301 tons; Province of Saxony, 187,326 tons; other German, 255,404 tons. *Zeitschr. f. Braunkohlen*, 1903, p. 387.

<sup>2</sup>*Dortmunder Jahrb.*, 1901, p. 570-1.

Ruhr coal has a specially wide market on account of its excellence and adaptability to various uses. The domestic consumption of Lower Silesian coal shipped by the main railways in 1902 was distributed as follows :<sup>1</sup>

Silesia .....	6,502,813 Tons.
Baltic ports (of East and West Prussia, Pomerania and Mecklenburg) .....	497,154
North Sea ports (Hamburg, Bremen, etc.) .....	3,052
East and West Prussia, Pomerania, Mecklenburg and Schleswig-Holstein .....	1,557,961
Province Hannover .....	55,265
Province Posen .....	1,465,047
Berlin .....	766,280
Brandenburg .....	785,582
Government District Magdeburg .....	136,942
Government District Merseburg and Erfurt .....	208,516
Kingdom of Saxony .....	237,996
Bavaria .....	18,639
Westphalia .....	6,925
Other Germany .....	3,780
<b>Total Germany .....</b>	<b>12,250,952</b>
<b>Total Germany (excluding Silesia) .....</b>	<b>5,748,139</b>

The official statistics of the Saar give the domestic consumption in 1901 as follows :<sup>2</sup>

Local .....	2,717,710 Tons.
Other Prussia .....	2,081,355
South Germany .....	2,378,240
Alsace and Lorraine .....	1,245,512
<b>Total Germany .....</b>	<b>8,422,817</b>

The coke sales in the local and domestic market for the Dortmund district production in 1899 were as follows :<sup>3</sup>

<sup>1</sup> *Statistik. d. Oberschl. B. u. -H.*, 1902, p. 64.

<sup>2</sup> *Berg. Hütt. u. Sal.*, 1902, p. 100.

<sup>3</sup> *Dortmunder Jahrb.*, 1901, p. 570-1. More in detail, the distribution in the domestic market outside of Westphalia and the Rhine Province was :

Brunswick and Hannover .....	327,460 Tons.
Magdeburg and Province of Saxony .....	241,864
Berlin and Province of Brandenburg .....	127,981
Thuringia and Kingdom of Saxony .....	147,824
Frankfurt and Hessen-Nassau .....	151,366
Bremen, Oldenburg and Ost-Friesland .....	50,565
Hamburg, Schleswig-Holstein and Jutland .....	95,770
Lübeck, Mecklenburg and Danish Islands .....	36,129
Bavaria, Baden and Württemberg .....	221,705
Alsace-Lorraine .....	1,448,039

	<i>Tons.</i>
Westphalia and Rhine Province .....	2,646,090
Other German .....	2,849,467
Total German .....	5,495,557

These tables show two things, first, that there are regions in which certain districts have a practical monopoly, and, second, that there are other competitive regions where two or more districts share the market. Unckell, a director of the Ruhr Syndicate, describes the boundaries of its non-competitive territory as follows: "The non-competitive region is bounded on the north by Holland, East Friesland and the Hamburg district, on the east by the province of Saxony, or more correctly, by the Elbe, on the south, we are met by Bohemian competition, and on the west by that of France and Belgium. It goes without saying that we have to reckon also with the competition of the Saar coal, but this is not so noticeable for us, inasmuch as the boundary of the non-competitive region must be drawn before reaching the Saar district."<sup>1</sup> The boundaries of the Upper Silesian non-competitive field have been described in a similar, if less precise, manner by General-direktor Bernhardt, one of the representatives of those interests in the recent inquiry. "The idea is widespread," says he, "that, because we are the second largest coal cartell, we were strong competitors of the Westphalian district. That is a great error. We compete only a very little with Westphalia; for there lie great buffer regions between the Upper Silesian and the Westphalian districts. We get beyond the Elbe only in exceptional cases; and where we have touched most sharply, as in the city of Berlin, it is rather an exception, and we do not compete there in a strict sense, be-

<sup>1</sup> Enquete, p. 70.

cause, besides ourselves, many other competitors are present. That is above all characteristic of the Upper Silesian sales that, in contrast to Westphalia, we rule without competition only in a very small district. This little district is only the province of Silesia, and, indeed, not unconditionally in Lower Silesia, because there rules a strong competition of brown coal, partly German, partly Bohemian, and perhaps also in the province of Posen, where, however, on the northern border, the competition of English coal comes into consideration".<sup>1</sup> The buffer region between Westphalia and Upper Silesia referred to in the foregoing is the brown coal district of central Germany.<sup>2</sup>

The third market that we have to consider is the foreign market and with that we may join the import trade. The figures for the Zollverein (Germany and Luxemburg) for 1902 are as follows :<sup>3</sup>

	<i>Import.</i> <i>Tons.</i>	<i>Export.</i> <i>Tons.</i>
Steinkohlen .....	6,425,658	16,101,141
Braunkohlen.....	7,881,986	21,765
Koks.....	362,488	2,182,383
Presskohlen, Torfkohlen, etc..	81,854	697,799

This table shows that Germany is decidedly more of an exporting than importing country. Reckoning five tons of Braunkohlen as equal to three tons of Steinkohlen, and assuming, as is warranted, that nearly all the Presskohlen are briquets, we have an import as compared with export of 3 : 5.

The question of import and export duties does not play an important rôle in the German coal trade. Neither Germany nor Austria levy duties on coal,

<sup>1</sup> Enquete, p. 326.

<sup>2</sup> Enquete, pp. 353-4.

<sup>3</sup> *Monatliche Nachweise*, etc., Dez., 1902, pp. 192-3.



and importation is free in England, Sweden, Belgium and Italy.<sup>1</sup> France, however, lays an import duty of 1.20 francs per ton,<sup>2</sup> and Russia from 2 to 3 marks per ton.<sup>3</sup> Between Germany and Luxemburg there is a Zollverein until 1950.<sup>4</sup>

The exports and imports of coal (Steinkohle) and coke for the principal countries trading with Germany in 1902 were :<sup>5</sup>

COUNTRY	Steinkohlen, tons		Coke, tons	
	Import	Export	Import	Export
Austria-Hungary . . . . .	542,312	5,604,497	26,327	539,908
Belgium . . . . .	496,083	2,217,419	176,385	176,042
France . . . . .	6,343	980,967	55,179	703,528
Holland . . . . .	171,755	4,540,955	185,100	
Italy . . . . .	..	37,479	..	28,521
Russia . . . . .	..	586,565	..	187,602
Sweden and Norway . . . . .	..	46,559	..	41,245
Switzerland . . . . .	..	1,019,704	..	125,802
United Kingdom . . . . .	5,192,147	30,838	..	15,733
Mexico . . . . .	..	..	..	113,192
Hamburg and Bremerhaven . (Free ports)	..	901,221	82,058	4,260

The trade in Braunkohlen is practically confined to Austria; the imports from there were 7,881,986 tons and the exports 20,144 tons.<sup>6</sup> A view of these statistics will show that the most important export markets for Germany are Austria-Hungary, Holland, Belgium,

<sup>1</sup> Tariffs of foreign countries. Special consular reports. Vol. XVI.

<sup>2</sup> Perquel, p. 22.

<sup>3</sup> Friedrich, p. 49.

<sup>4</sup> *Stahl u. Eisen*, 1902, p. 1374.

<sup>5</sup> *Monatliche Nachweise*, Dez., 1902, p. 192.

<sup>6</sup> *Monatliche Nachweise*, Dez, 1902, p. 192-3. The trade in briquets, etc., though not so considerable, was more widely distributed. The imports were from Austria-Hungary. 73,042 t.; from Belgium 643,540 t.; from Holland, 74,699 t.; the exports were, to Austria-Hungary, 234,311 t.; to Belgium. 323,297 t.; to France, 173,728 t.; to Holland, 2,276,451 t.; to Switzerland, 3,715,406 t.; and the freeport of Hamburg, 57,026 t.

Switzerland, France and Russia. That is, Germany exports considerable quantities to her continental neighbors, but not much over-sea. The most important imports are Steinkohlen from England and Braunkohlen from Austria. In the case of Austria it is almost an even exchange (quality considered), while with England alone is Germany a debtor on account of fuel.

It is much easier to show the exports of the country at large than for the particular coal producing districts. Where cartells exist the export policy becomes one of peculiar interest and importance.

For the Ruhr syndicate the coal export in 1902 was as follows : <sup>1</sup>

Belgium .....	1,778,680 tons.
Denmark .....	76,100 "
France .....	440,335 "
Holland .....	4,163,156 "
Italy .....	84,659 "
Switzerland .....	165,863 "
Other countries .....	161,303 "
Total .....	6,870,196 "

The export of the Lower Silesian district in 1900 was : <sup>2</sup>

Poland .....	58,000 tons.
Hungary .....	4,700 "
Bohemia .....	1,041,000 "
Elsewhere in Austria .....	229,000 "
Total .....	1,334,000

The coal export of the Upper Silesian district (by main railways) in 1902 was as follows : <sup>3</sup>

Russia (excl. Poland) .....	9,072 tons.
Poland .....	619,824 "
Galicja, Bukowina, etc. ....	594,091 "
Hungary .....	556,315 "
Bohemia .....	506,708 "
Other Austria .....	2,791,483 "
Switzerland .....	30 "
Total .....	5,077,523 "

<sup>1</sup> Enquete, p. 280.

<sup>2</sup> Friedrich, 62.

<sup>3</sup> Statistik Oberschl. B.-u.-H., 1902, p. 64.

The coal export of the fiscal Saar in 1901 was as follows :<sup>1</sup>

Luxemburg.....	45,985 tons.
France.....	359,832 "
Switzerland.....	532,125 "
Austria.....	16,273 "
Italy.....	2,530 "
Total.....	956,745 "

From a consideration of their geographical location it is evident that the districts of Upper Silesia, the Saar and Aachen are naturally directed to the exportation of a part of their production to the countries respectively adjacent to them. It is the same in a certain degree for the Bohemian brown coal with regard to some German markets. In most cases the consumer finds in them his necessary source of supply. In some cases, however, especially for English importations on the North Sea and Baltic, the producer in the importing country is a strenuous competitor. Hamburg, with its great coal demand for shipping is the chief seat of the contest on the North Sea where the English and Germans wage nearly equal war. The figures for 1902 are :<sup>2</sup>

English coal.....	2,792,822 tons.
Westphalian coal.....	1,773,800 "
Total.....	4,566,622 "

A similar rivalry exists in the Baltic between English and Upper Silesian coal. For sixteen of the chief ports the figures for 1902 are :<sup>3</sup>

Upper Silesian coal.....	2,055,105 tons.
English ".....	1,724,567 "

The exports of the Westphalian coke syndicate in 1902 were :<sup>4</sup>

<sup>1</sup> *Berg. Hütt. u. Sal.*, 1902, p. 100.

<sup>2</sup> Bericht d. Kohlen Syndicat, 1902, p. 12.

<sup>3</sup> Statistik Oberschl. B.-u.-H., 1902, p. 65.

<sup>4</sup> Enquete, p. 622.

France.....	710,870 tons.
Belgium .....	153,947 "
Holland .....	47,778 "
Switzerland .....	100,305 "
Italy .....	33,687 "
Spain .....	30,327 "
Austria .....	186,405 "
Russia .....	75 612 "
Sweden-Norway .....	54,043 "
America .....	183,895 "
Other countries.....	35,110 "
Total.....	1,611,979 "

For Upper Silesia the total coke production in 1900 was 536,000 tons, of which more than half was exported; to Austria 231,000 tons, and to Russia 61,000 tons.<sup>1</sup>

Another way to get a picture of the markets is to take the statistics of importation of the chief importing countries where the origin of the shipment is shown. For example, all the coal imported from Germany into Bohemia comes from Silesia; in the case of coke, however, of a total importation from Germany in 1901 of 329,309 tons, the Ruhr furnished 38,535 tons, and Silesia 246,439 tons. For Switzerland most German coal in 1901 came from the Saar, viz., 530,470 tons, while the Ruhr furnished 246,837 tons.<sup>2</sup>

<sup>1</sup> Friedrich, p. 63.

<sup>2</sup> Cf., Van der Borcht; *Conrad's Jahrb.*, 1903, III, F., pp. 175, 178-9.

## CHAPTER III

### TRANSPORTATION

The extent of the market for any given coal field depends largely on the means and costs of transportation, but here as in most other economic relations there is action and reaction, and the existence of a potential market may be the cause of developing means of communication by the construction of new routes or the adjustment of freight charges. In the Ruhr district, for example, the natural conditions are in favor of freight movements to the north and south, and in a less measure west, but the existence of a large market in Central Germany—particularly Berlin—has led to a demand for a midland canal. The railway rates, in Germany as elsewhere, are regulated not only with respect to the distance of the haul, but also with respect to the markets and the conditions of competition. In Germany, most of the railways are owned and operated by the government (state or imperial) and on the principle of profits; as compared with America, the charges are high.<sup>1</sup> Hence waterways have a special significance. In some respects Germany is well provided with this means of transportation; South Germany is connected with the great industrial region by the Rhine, Silesia with Berlin and Hamburg by the Oder, Havel, Elbe, etc., but the connections between east and west are deficient and the project of a great midland canal is still being debated. Local interests which would be put at a competitive disadvantage, or at least fear so, seem likely to prevent its accomplishment.<sup>2</sup>

<sup>1</sup> Cf., *Cent. Verband D. I.*, 1901, p. 126.

<sup>2</sup> See Prusmann and Sympher. The Silesian industrial interests, as well as the Agrarians oppose it. Cf., *Oppeln Hk.*, 1899, p. 4. *Industrie Ztg.*, 1899, p. 370. *Ztg. Oberschl. B.-u.-H.*, 1898, p. 399, etc.

The main waterways of Germany (*i. e.*, navigable by vessels of 400 tons) are: (1) the Rhine as far as Karlsruhe, (2) the Weser to Bremen, (3) the Elbe to Prag, (4) the Oder to Cosel; this is connected with the Elbe, (5) the Dortmund-Ems Canal, from Dortmund to the sea, at Emden, (6) the Kiel Canal.<sup>1</sup>

The topography of Germany is not sufficiently mountainous to offer any considerable obstacle to railway communication and, with an extensive railway network established, the principal problem in transportation is to get a favorable rate, and this forms a subject of unceasing discussion and negotiation between the shippers and the railway administrations. Special rates for coal are made to the principal competitive points and large markets; for example, from the Ruhr to Hamburg, to the Minette, to Siegerland, to Switzerland, etc., and from Upper Silesia to the Baltic ports and to the Russian border. The rates are systematically planned to favor the transportation of home products in competition with the foreigner; low export rates are allowed while import rates are made higher.<sup>2</sup>

The railway is the chief means of transportation for the coal and coke shipments of the Ruhr, as may be seen from the following statistics for 1897; (1) by rail from the mines to the Rhine ports (Ruhrort, Duisburg and Hochfeld) and thence by water—about 8,000,000 tons, (2) by rail to points on the left bank of the Rhine

<sup>1</sup> Sympher, Anlage 8. The secondary waterways are (1) the Weser between Bremen and Cassel; (2) the canal and river connection between the Oder, at Custrin, and Weichsel, at Bromberg; (3) the Marne-Rhein waterway running from Strasburg to Saarbrücken, Metz, etc.; (4) the Warthe, from the Polish border to the Netze; (5) the Main to Würzburg, and (6) the Saale, from Halle to the Elbe.

<sup>2</sup> For the very numerous special rates on coal and coke (some thirty-five in all) see *Uebersicht ueber die auf den preussischen Staatseisenbahnen im Güterverkehr bestehenden Ausnahmetarife*.



(e. g., Luxemburg, Belgium, Holland, etc.,) and to South Germany—about 8,100,000 tons, (3) by rail to Hannover, Oldenburg, Anhalt and Magdeburg—about 3,150,000 tons.<sup>1</sup> The new Dortmund-Ems Canal has not changed the situation much; the shipments of all kinds of goods, seaward, in 1902 amounted to only 346,954 tons;<sup>2</sup> the coal interests claim that the rates are too high, but in official quarters it is explained on the ground of the newness of the enterprise.<sup>3</sup>

The coal mines of Upper Silesia are very unfavorably situated for transportation.<sup>4</sup> The Oder is improved, but the route is very unsatisfactory with droughts and floods,<sup>5</sup> so that, partly from this cause, partly on account of the importance of shipments to Austria, only a small portion goes by water. Thus in 1897 of a total sale of 20,706,000 tons, 14,482,000 tons were sent by rail and 1,077,000 tons by water.<sup>6</sup> Low railway rates are of great importance in order to compete with the English on the Baltic and to overcome the import tax on coal levied in Russia. There is often naturally a conflict of interest in the matter of railway rates between the different coal districts. Friedrich, for example, notices an attempt of the Ruhr producers to get a special rate to southwestern Bohemia—one of the markets claimed by Silesia; it was refused.<sup>7</sup>

The costs of transportation to the German markets

<sup>1</sup> Sympher, p. 27.

<sup>2</sup> *Bericht d. Kohlen Syndicat*, 1902, p. 10.

<sup>3</sup> Peters: Die finanzielle Entwicklung der preuss. Binnenwasserstrassen. *Archiv. f. Eisenbahnwesen*, 1902, p. 813.

<sup>4</sup> Cf., Renault, p. 44, *et seq.*; *Oppeln Hk.*, 1900, pp. 6-7.

<sup>5</sup> Enquete, p. 517.

<sup>6</sup> Renault, p. 55.

<sup>7</sup> Friedrich, p. 64.

from foreign countries are often much less than for home producers. The English, from the location of their mines on the sea-coast in Yorkshire or Wales, can ship at small expense to the German ports. The current freight for Newcastle coal to those points is about  $3\frac{1}{2}$  shillings.<sup>1</sup>

From Hamburg, Stettin or Dantzic the rivers furnish cheap inland transportation. In the west, that is on the Weser above Bremen or on the Ems, English coal meets a strong competitor in the Ruhr, and does not penetrate far, but, as we have had occasion to observe elsewhere, it gets to Berlin. Ruhr coal, going to Berlin, generally goes first by rail to Hamburg.<sup>2</sup>

The Elbe furnishes an open door for the importation of Bohemian coal into Germany, which is found even in Prussian Saxony.<sup>3</sup> It finds a better market, however, in South Germany. Belgium occupies a favorable position for trade with the German industrial regions, but her own wants, as well as a greater cost of production and carriage, in most cases make the sales of coal relatively small. In respect to coke there is a definite pool with the Ruhr syndicate.<sup>4</sup> The transportation facilities between Germany and France are not specially favorable. The canalization of the Mosel and Saar is still a paper project. In spite of the French import tax the movement of coal is almost entirely westward. Russia cannot supply her own needs either, but draws revenue from the Silesian producers by the imposition

<sup>1</sup> *Glückauf*, July 4, 1903.

<sup>2</sup> Sympher, p. 6.

<sup>3</sup> Haacke, p. 32.

<sup>4</sup> See p. 000 below.

of duties on their trade across the border.<sup>1</sup> For the foreign market England is a dominating and ubiquitous competitor, with the United States appearing in the Mediterranean occasionally, as well as in trans-oceanic markets.

The following data as to rates will give some idea of the relation of transportation charges to the various domestic market points.<sup>2</sup>

*Charges for Transportation to Berlin, 1898.*

<i>All Rail.</i>		<i>Rail and Water.</i>	
	<i>M.</i>		<i>M.</i>
From Herne (on the Dortmund-Ems Canal, in the Ruhr district) .....	10.30	via Hamburg .....	9.60
From Königshütte (in Upper Silesia) .....	10.52	via Breslau and Poppelwitz .....	8.55
From Dittersbach (in Waldenburg district) .....	7.39	via Breslau .....	6.45

*Charges for Transportation to Dresden (Rail and Water.)*

From the Ruhr .....	7.50	(Good water) .....	6.30
From Lower Silesia .....	5.70	.....	.....

*Charges for Transportation to Sea Ports (all Rail.)*

From Wanne (in Ruhr district) .....	{	to Hamburg <sup>3</sup> .....	5.50
		to Bremen-- { Domestic .....	5.50
" .....	{	Export .....	4.70
		to Papenburg { Domestic .....	4.30
From Königshütte (in Upper Silesia) .....	{	Export .....	3.80
		to Stettin .....	7.53
" .....	{	to Dantzig-- { Domestic .....	8.98
		Export .....	8.21
" .....		to Königsberg .....	10.81

The transportation charges from the Ruhr to the Minette are :<sup>4</sup>

<sup>1</sup>The only non-European producer that could be considered with respect to German markets is the United States. With rates as low as 3-5 m. for eastward traffic, as they have sometimes been, American coal would be a possible competitor. (*Cf. Aeltesten, 1901, p. 17*). But the average cost of transportation is from 8-9 m., which puts it out of the question. *Cf. Coal Trade Journal, 1902, p. 35.*

<sup>2</sup>Sympher, pp. 135-6, Anlage, 11.

<sup>3</sup>The cost of transportation by the canal, including all incidental expenses, is reckoned at 5.20. Bericht d. Kohlen Syndicat, 1900, p. 11.

<sup>4</sup>*Stahl u. Eisen, November 1, 1903.*

	<i>M.</i>
Coal .....	8.30
Coke .....	7.80

One thing must be kept in mind constantly in figuring the market possibilities when the costs of transportation are given and that is that in modern industry, and above all in cartelled industry, the prices are made to suit the market to a large extent, and obstacles in the way of high transportation charges (as well as customs duties) are neutralized by a corresponding differentiation of prices.

## CHAPTER IV

### CAPITAL, ORGANIZATION AND LABOR

The question of the value of the coal properties is a difficult one to answer, but the following estimates may serve to give an idea of the matter at least in the case of the Ruhr. Taking, first, the quotation of the shares (Berlin) of thirteen corporations at the end of 1902, and comparing them with the par values respectively, we get a total value for the share capital of 507.2 million marks. The existing obligations of these companies are given as 68.1 millions, which makes a total value for these concerns of 575.3 millions marks.<sup>1</sup> These

COMPANY	Capital, par	Quota- tion	Shares, market val	Obliga- tions, par	Total value	Output 1000 t.
	M.		M.	M.	M.	
Aplerbecker . . .	2,400,000	90.50	2,172,000	1,064,500	3,236,500	205
Arenberg'sche . .	6,000,000	588.00	35,280,000	765,000	36,045,000	1184
Bergbau u. Schiff	7,000,000	122.00	8,540,000	1,240,000	9,780,000	327
Kölnner Bgw. . . .	6,000,000	374.00	22,440,000		22,440,000	741
Concordia . . . .	8,000,000	263.00	21,040,000		21,040,000	684
Consolidation . .	16,000,000	353.00	56,480,000	1,154,000	57,634,000	1366
Gelsenkirchen . .	60,000,000	179.90	107,940,000	12,951,000	120,891,000	5089
Harpener . . . . .	60,000,000	169.30	101,580,000	19,225,496	120,805,496	4875
Hibernia . . . . .	39,400,000	178.30	70,210,800	10,952,000	81,162,800	3314
Königsborn . . . .	9,000,000	134.50	12,105,000	5,250,987	17,355,987	726
Mülheim . . . . .	15,000,000	88.75	13,312,500	5,530,010	18,842,510	996
Nordstern . . . . .	20,000,000	248.00	49,600,000	8,323,900	57,923,900	2174
Rhein-Anthrac. . .	3,900,000	126.10	4,917,900	1,691,000	6,608,900	229
	352,700,000		507,218,200	68,147,893	575,366,093	22116

mines produced 22.1 million tons of coal. Assuming a like relation of value and output for the whole district, we obtain by proportion a total value of 1514.4 million marks. This is probably somewhat too large, because the proportion of invested capital to output is greater in the large concerns than in the small ones, and they are also more profitable, and hence have a higher value per ton. No considerable error is involved in taking the bonds at par. Second we may take the market quota-

<sup>1</sup> Compiled from Saling, 1903-4.

tions of the Kuxe<sup>1</sup> of 46 Gewerkschaften at the highest bid for 1902 on the stock exchanges of Essen and Düsseldorf, and multiply them by 1000 (the number of Kuxe), which gives a total of 314.8 millions as the market value of the mines. In this case the indebtedness is not in all cases available and is left out; it is relatively unimportant. These Gewerkschaften produced 15.5 million tons in 1902.<sup>2</sup> Working out the

COMPANY.	Highest bid, 1902.	Output 1000 tons.	COMPANY.	Highest bid, 1902.	Output 1000 tons.
Bickelfeld .....	625	161	Gen. Blumenthal.....	15,500	842
Charlotte .....	365	80	Graf Bismarck .....	50,000	1134
Deutschland .....	2,050	260	Graf Schwerin .....	6,025	350
Freie Vogel, u. Unv... ..	1,400	143	Hamburg u. Franz. ....	3,725	561
Friedl. Nachbar .....	3,750	395	Heinrich .....	3,150	131
Gottessegen .....	4,850	143	Helene u. Amalia .....	15,000	728
Sieben Planeten .....	2,450	237	Hercules .....	6,825	366
Stock u. Scheren. ....	1,325	—	Joh. Deimelsburg .....	3,525	194
Trappe .....	2,390	124	Julius Philippe .....	610	225
Alte Haase .....	1,010	93	Kaiser Friedrich .....	550	137
Altendorf .....	1,000	114	Königin Elisabeth .....	15,200	661
Blankenburg .....	2,970	101	König Ludwig .....	13,750	577
Bommerbank .....	510	128	Langenbrahm .....	10,400	296
Borussia .....	1,625	152	Lothringen .....	14,050	479
Caroline .....	1,230	106	Mt. Cenis .....	12,750	665
Carolus Magnus .....	6,050	247	Portingsiepen .....	4,725	170
Constantine d. Gr. ....	15,900	875	Rudolph .....	610	—
Dahlhauser .....	2,450	142	Schür. u. Charl. ....	1,400	152
Dorstfeld .....	8,050	498	Tremonia .....	1,840	235
Eiberg .....	3,525	276	Unser Fritz .....	15,100	574
Eintracht .....	5,250	409	Victor .....	11,000	596
Ewald .....	22,700	852	Victoria .....	1,050	101
Friedrich d. Gr. ....	8,550	477			
Fröhl. Morgensonne. ....	8,000	397	Total .....	106,165	4868

proportion, as before, we have a total calculated value for the Ruhr of 1177.9 millions marks. The first estimate is probably too high, and the second too low. If we assume the mean to be near the true value, we have

<sup>1</sup> See p. 34; Kuxe are shares without a nominal par; here 1,000 for each company.

<sup>2</sup> Data for first nine Gewerkschaften from Düsseldorf Hk., 1902, I, p. 164; rest from Essen Hk., 1902, I, pp., 72-6.

a total computed value for the Ruhr district of 1346.1 million marks (about \$300,000,000).<sup>1</sup>

It is very generally remarked that coal mining is according to its nature a large industry.<sup>2</sup> But although the development of industry and wealth in Germany, especially in the last few decades has produced some large concerns, they do not either in industry or mining, in any case, perhaps, except Krupp, represent what would be called today an extraordinary aggregation of capital.<sup>3</sup> One reason for this is the organization of cartells, which have checked wide-reaching consolidations. Taking the cartells themselves, however, as industrial units, and this in many cases is quite admissible, the investment of capital under unitary control is sometimes very large and this is particularly true in the case of the Ruhr coal syndicate. If, however, we leave the syndicates out of the reckoning, the largest single coal producer in Germany is the Prussian fiscus. The Gelsenkirchen mining company produced 5,088,150 tons in 1902.<sup>4</sup> The eleven fiscal mines of the Saar produced 9,376,023 tons in 1901, and the three fiscal mines of Upper Silesia produced 5,305,910 tons in the same year, making a total of 14,681,933 tons from these two districts.<sup>5</sup> The other fiscal mines, mostly brown coal, may be omitted for this comparison. The large purchases in the Ruhr are but little developed.<sup>6</sup>

<sup>1</sup>For the mines of the Ruhr syndicate comprising 82.9% of the total output we may reckon a value of 1115.9 million marks (about \$268,000,000).

<sup>2</sup>Arndt: *Bergbau-u-Bergbaupolitik*, pp. 4-7; Gothein: *Sollen wir unseren Bergbau Verstaatlichen?*, p. 19.

<sup>3</sup>*Cf.*, Schacht: *Der Stahltrust*, *Preuss. Jahrb.*, Juni, 1903.

<sup>4</sup>*Steinkohlenzechen*, p. 29.

<sup>5</sup>*Berg. Hütt. u.-Sal.*, 1902, II, pp. 68-125.

<sup>6</sup>*Cf.*, *Verzeichnis*, p. 7.

Before considering the various forms of mining associations and their importance a few points in the general mining law should be noticed. The right to mine coal is a regality or prerogative of the state according to Prussian and German law generally, with a few exceptions. A person on showing evidence that minerals exist may enter the lands of another, seek for the same, and mine them. One claim is limited to 2,189,000 sq. meters.<sup>1</sup> Of course there are numerous important police regulations, but the only one limiting the property interest of the owner of the claim, that we need notice here is, § 65 of the general mining law. (June 24, 1865) by which the owner of the claim is required to proceed with the proper exploitation of the mining land when called upon to do so in behalf of the public interests by the superior mining bureau (Oberbergamt).<sup>2</sup>

The mines may be distinguished according to ownership into four groups, (1) fiscal or state mines, (2) mines of private individuals, (3) *Gewerkschaften*, (4) *Actien-gesellschaften*. We might add a fifth distinction—namely syndicate mines, but though economically valid it would scarcely conform to a legal classification of ownership. The fiscal mines require no explanation; they are simply mines owned by the State and run on business principles. The second group also explains itself. The *Gewerkschaft*, however, is of a more peculiar character, and is the usual form of organization. A *Gewerkschaft* is a legal person at German common law and is recognized by statute in Prussia and Saxony. There is limited liability, but there is no necessity for

<sup>1</sup>Arndt: *Bergbau u. Bergbaupolitik*, p. 26 *et seq*; the same, article *Bergbau*, *Handwörterbuch der Staatswissenschaft*, 1899, p. 548 *et seq*.

<sup>2</sup>X Commission, p. 19.



any subscription of capital to start the concern. Persons who wish to mine together may simply go ahead, with certain rules established for them regarding sharing the product, assessment for expenses and liability for debts. The property interests are represented by ideal shares (*Kuxe*) which stand for a certain fractional part of the whole; in Prussia formerly 1-128th, and then 1-100th, but now generally 1-1000th.<sup>1</sup> The larger mines are generally organized as *Actiengesellschaften* (*A. G.*), which are much the same as corporations in the United States.

Some of the mines in the Ruhr are owned by private individuals. Thus, until 1903, Friedrich Krupp and his successors owned three mines which now belong to the corporation bearing his name. The Haniels, Stinneses and Thyssens own several under the nominal form of a *Gewerkschaft*.<sup>2</sup> There are from about 90 to 100 mines in the Ruhr district organized as *Gewerkschaften*, mostly singly, but sometimes two are consolidated. The larger enterprises generally take the form of *Actiengesellschaften* and usually represent combinations of several mines. Thus Harpener includes 15 mines, Gelsenkirchen 9, Hibernia 5, Mülheim 4, Nordstern 3, etc. Quite a number are owned by iron and steel works and other large consumers of coal. This was the case, practically, of the Krupp mines, and is so today. The most important owners of this class are the blast-furnace companies who have in all about 21 mines; Gutehoffnungshütte 4, Union 3, Bochumer Verein 4, F. Krupp, A. G. 3, etc.

<sup>1</sup> Arndt : *Bergbau u. Bergbaupolitik*, p. 59; the same *Handwörterbuch*, pp. 552-3.

<sup>2</sup> Cf., *Verzeichnis, passim*.

The situation in Upper Silesia is in some respects peculiar. Most of the coal property is in the hands of the nobility of the region, some of whom possess regalities. Their estates are often "majorats" or *fidei commisse*, and are, therefore, not in the market. It is said also they are not encumbered.<sup>1</sup> Of the sixty-three mines in the district thirty-six were owned by seven associations or estates.<sup>2</sup> The rest are scattered among nobility, burghers and companies, both Actiengesellschaften and Gewerkschaften.<sup>3</sup>

It is interesting to note that the nobility have increased their share positively and relatively during the last decade.<sup>4</sup> Four owners including the Prussian fiscus possess 51.2 % of the total production in 1902.<sup>5</sup>

In the Waldenburg district a non-capitalistic system is said to prevail with most of the property in the hands of peasant Gewerkschaften.<sup>6</sup> The mines of the Saar, in Prussia, with one insignificant exception are owned by the fiscus. In the Aachen district there are only three important mines<sup>7</sup> which are closely allied.

In a thickly populated country such as Germany the

<sup>1</sup>Renauld, 52.

<sup>2</sup> Grafen Hugo, Lazy and Arthur Henckel v. Donnersmarck	12
Fürst v. Pless	5
Kattowitzer, A. G. f. Bergbau u. Eisenhüttenbetrieb	5
Fürst Hohenlohe-Oehringen, Herzog v. Ujest	5
Königliche Preussische Staat	3
Ver. Königs u. Laurahütte, A. G. f. Bergbau u. Hüttenbetrieb	3
Bergwerksgesellschaft v. Giesche's Erben	3

<sup>3</sup>Cf., *Statistik d. Oberschel, B.-u.-H.*, 1902, pp. 24-26.

<sup>4</sup>Cf., *Zig. Oberschel, B.-u.-H.*, 1891, p. 151.

<sup>5</sup>Fiscus, 5,136,827 tons; v. Giesche's Erben, 2,660,432 tons; Kattowitzer, A. G. 2,426,329 tons; Königs u. Laurahütte, 2,410,439 tons. Cf., *Enquete*, pp. 555-6.

<sup>6</sup>Gothein, p. 18.

<sup>7</sup>Steinkohlenzechen, pp. 73-5.

labor supply is, on the whole, plentiful and cheap. The total number employed in coal mining (Steinkohlen) in the Empire, in 1901, was 448,000,<sup>1</sup> of which 406,215 were employed in Prussia, distributed as follows:<sup>2</sup>

Mining district, Breslau .....	104,295
"    "    Halle .....	46
"    "    Clausthal .....	3,556
"    "    Dortmund .....	243,926
"    "    Bonn .....	54,392

The distribution by age, sex and occupation for the important mining regions was as follows.<sup>3</sup>

	Regular miners	Other under-ground laborers	Men above ground	Boys under 16	Female	Total
Upper Silesia ..	44,152	11,618	15,144	2,120	4,149	77,183
Lower Silesia ..	12,234	4,434	6,303	797	339	24,107
Dortmund .....	119,130	67,267	42,290	8,082	---	236,769
Bonn .....	24,517	10,322	5,610	1,474	---	41,923
	200,033	93,641	69,347	12,473	4,488	379,982

It will be observed that only in Silesia is there a considerable number of female laborers. In the west a good many of the miners are immigrants, attracted by the relatively high wages. The Poles especially are drawn from the eastern provinces of Prussia.<sup>4</sup> Compared with the earlier type the modern miner is said to be of a lower grade;<sup>5</sup> the work has become more me-

<sup>1</sup> *Jahrb. d. Deutsches Reich*, 1903, p. 46.

<sup>2</sup> *B.-H. u. S.*, 1902, I, 54-5.

<sup>3</sup> *B.-H. u. S.*, 1902, I, pp. 30-3.

<sup>4</sup> The origin of the immigrants in the Ruhr are given as follows: Upper Silesia, 5,000; Posen, 1,800; East Prussia, 20,000; West Prussia, 6,000; Dutch and Belgian, 1,500; Italian, 1,400; Austrian, 3,400. *Abgeordnetenhaus, Protokoll*, 1900, Bd. I, p. 880.

<sup>5</sup> Oldenburg, 289; Schneider, 30. According to Dr. Tilly, the miner proper in the Saar prides himself on being a "königlicher Bergmann," and not a common laborer. *Kölnische Ztg.*, July 11, 1903.

chanical. One of the problems of the industry is to get a sufficient supply of labor, and to keep it. Since the demand for, and output of coal is subject to variations, the practice is to vary the time of operation rather than the number of persons employed.<sup>1</sup> When the wages are high and employment easily obtained the miner is not so steady in his labor. The mining interests of Silesia complain of the withdrawal of labor in the harvest season, and also of the attraction of mining labor to the Ruhr by the producers of that region.<sup>2</sup> One of the reasons given for the difficulty in meeting the demand for coal in 1900 was the great scarcity of labor.<sup>3</sup>

<sup>1</sup> Enquete, p. 258.

<sup>2</sup> Oppeln Hk., 1900, p. 11.

<sup>3</sup> X Commission, 1901, p. 20-21.

## PART II

### HISTORY OF THE COAL COMBINATIONS

#### CHAPTER I

##### HISTORY OF THE FORMATION OF COAL COMBINATIONS IN THE RUHR BEFORE THE SYNDICATES

When coal was first discovered and mined in Germany does not seem quite clear,<sup>1</sup> but at any rate it was not of any industrial importance until about the beginning of the nineteenth century. In the middle of the eighteenth century the production of Germany (excluding Austria) was 150,000 tons, and in 1800 it amounted to only 500,000 tons. In 1737 the Ruhr produced 30,000 tons, in 1800 about 200,000 tons.<sup>2</sup> The German coal industry was far behind the English not only in production and technique<sup>3</sup> but also in business organization.<sup>4</sup> Until the fourth decade of the nineteenth century almost all the mines of the Ruhr were worked by slopes or tunnels with natural drainage. Under such conditions a primitive, non-capitalistic system of mining prevailed, which gave no special advantage to large plants, and furnished little or no incentive to monopolistic combination.<sup>5</sup> The development of deep-shaft min-

<sup>1</sup> According to Oldenburg (p. 272) the coal industry in the Zwickau district dates from the tenth century, in Westphalia from 1302, in the Saar from 1529 and in Silesia from the seventeenth century; *cf.*, however, Fechner p. 469, Arndt, p. 11-12, Festenberg-Packisch, p. 67, etc.

<sup>2</sup> Oldenburg, pp. 272-3.

<sup>3</sup> Festenberg-Packisch, p. 64.

<sup>4</sup> *Cf.*, Cohn, pp. 206-226.

<sup>5</sup> Dr. Beumer, the well-known industrial writer, said recently in the Reichstag that a cartell existed in the Essen-Weidener district in 1827. Reichstag Protocoll., Nov. 4, 1902, p. 6136.

ing in the forties changed, in the course of a few years, the whole character of the industry. The rigid control of production by the state was largely removed in Prussia by the act of 1851 and almost completely by the act of 1865.<sup>1</sup> Improved technique and greater industrial freedom led to a great expansion in production especially in the Ruhr which in 1830 was only two-fold that of 1800, but in 1850 seven times as great. From 1850 to 1860 it increased from 1,665,662 tons to 4,365,834 tons per annum.<sup>2</sup> During the fifties there was a great deal of speculation and promotion which ended in the crash of 1858-9.<sup>3</sup>

It is at this point that the history of coal combinations begins, taking the word in its larger meaning, though it needed a score of years more before the first cartell was established. In 1858 the association for the mining interests of the mining district of Dortmund was founded,<sup>4</sup> which from that time on was conspicuous in its efforts to promote the interests of that region and, in particular, pursued the policy of combination with great tenacity. At that time it directed its energies to the promotion of the export trade in order to relieve the coal industry from the evils of over-production. Indeed at the time of its foundation it was far from the thought, then unfamiliar, of procuring any regulation of the market by interfering with free competition, and even as late as 1873, while denouncing such a policy as uneconomic, it denied that any effort of that kind existed among the producers of the district.<sup>5</sup> If such projects were foreign

<sup>1</sup> Oldenburg, pp. 273-4, Hundt, pp. 173-4.

<sup>2</sup> Schneider, p. 39.

<sup>3</sup> Oldenburg, pp. 274-5.

<sup>4</sup> Verein für die bergbaulichen Interessen des Oberbergamtsbezirk Dortmunds.

<sup>5</sup> *Jahresbericht d. Vereins*, 1873, p. 17.

to the purposes of the mine-owners in 1873, at the height of the boom, a marked change appeared in the next few years, when the newly blossomed German industry went through a severe ordeal. In a decade that marked the swing from free-trade to protection, it is not strange that the principle of free competition began to give place to the principle of combination. The raw iron industry had demanded and received protection; the coal industry had to take care of itself, and it saw only one course open—combination—both for maintaining the home market and for developing exports. Both policies were inaugurated in the same year. In 1877 the Westphalian Coal Export Association was established and the Berg and Mark Mining Company,<sup>1</sup> attempted to develop the trade to the East and to distant domestic markets.

In the same year the first definitely known<sup>2</sup> coal cartell was formed.<sup>3</sup> This provided for a temporary contraction of production (three months) of ten per cent. and included only certain sorts of coal mines.<sup>4</sup> This was not successful in producing the desired effect, although the agreement was enforced by a penalty clause and was duly kept. A similar but more elaborate effort was made in the autumn of 1879 and lasted about six months.<sup>5</sup> Although it also was not very successful, the principle found favor.

<sup>1</sup> Gruner et Fuster, p. 2 note; Sarter, p. 6; Huckinghaus, pp. 31-2; Steinmann-Bucher, *Ver. f. Soz. Pol.*, p. 215.

<sup>2</sup> There appears to have been some sort of a cartell in 1875 for 'long flame' coal. *Cf.*, Gruner, p. 17.

<sup>3</sup> To avoid a multiplicity of particular references a general reference is made here for the history of the formation of the coal cartels to Gruner, Huckinghaus, Sarter, Oldenburg and Steinmann-Bucher; authorities less easily available will be cited particularly.

<sup>4</sup> Kirdorf, *Cent. Verband, D. I.*, 1901, p. 223.

<sup>5</sup> *Bochum Hk.*, 1879, p. 8.

To properly appreciate the course of events, we must glance at the general industrial situation. The early seventies witnessed a tremendous industrial and speculative inflation which had been most pronounced in the coal and iron trades. Prices had risen very high and then suffered an equally marked collapse. The advance and decline in securities had been even more extraordinary. Purchasers of stocks in the boom period naturally suffered. Coal prices fell to a point that was below the cost of production for most mines and naturally far below the point of profit for those who had purchased them during the "*hausse*."

The nature of the mining industry, when it assumes a highly capitalistic character, is such that the greater the production, the less the cost per ton. The prosperous years attract new investments of capital when profits are tempting, owing to decreasing costs and advancing prices, and when the lean years come, and prices fall, the hard times, instead of leading to a reduction of output (which would increase costs) lead to an increase of production which, of course, only aggravates the fall in prices and the general difficulty. The reason is that under a system of free competition no one mine can afford to limit its output—it would simply be playing into the hands of its rivals. Production must go on in order to pay some (even if an inadequate) return on the capital which is invested and which can not be withdrawn. Hence each mine tries to produce the greatest possible amount, hoping to gain something by increased cheapness of output, and recognizing that that part of the decline in price caused by its own contribution to the increase in output will be for it the lesser evil.

In 1880 a proposition was made by the management



of the mine Hannibal, looking either (1) to the establishment of a common selling bureau, or (2) a consolidation of the mines.<sup>1</sup> The time was not ripe for such measures; the individual operators were too little accustomed to co-operation for much less difficult undertakings. One step taken at this time which aimed to establish stronger bonds of union among them was the organization of a "Kohlen Klub" which played a considerable though inconspicuous rôle for the following decade.<sup>2</sup>

Agreements similar to that for 1880 were made in 1881, 1882 and 1883. They did not meet expectations though it would be too much to say, they were without effect.<sup>3</sup> The attempt to renew the agreement for 1884 on the basis of production equal to 1883 failed on account of the excessive demands of some mines, but the purpose was not abandoned. The market which had shown an improving tendency from 1881 to 1883 went off in 1884.<sup>4</sup> A rather elaborately organized cartel was formed in 1885 (including 91.52 % of the output of 1884) providing for a contraction of production, with fines on excess production and premiums on deficiency. It did not succeed in restricting production. According to Oldenburg it broke down on account of complications with the newly formed coke cartel.

Meantime efforts had been made to remedy the evils by simple agreements as to prices. The first effort of this sort appears to have been in 1878 among the gas coal mines of Bochum and Gelsenkirchen, but it did

<sup>1</sup>*Bochum Hk.*, 1880, p. 6.

<sup>2</sup>*Cf. Kirdorf., Cent. Verband, D. I.*, 1901, pp. 223-4.

<sup>3</sup>*Bochum Hk.*, 1883, p. 6, etc.

<sup>4</sup>*Bochum Hk.*, 1881-1884.

not last long ; equally futile attempts are mentioned for 1879 and 1884. So also the "Gasflamm" coal mines attempted price regulation unsuccessfully in 1881 and 1883. A more favorable result was obtained in both lines in 1887.

In 1882 the first attempt was made to regulate the minimum price of coke, which offered special advantages for this sort of a pool on account of its more uniform quality. This pool lasted one and a half years and proved profitable, but new technical developments disturbed the arrangements and the price agreement was evaded by rebates, etc., so that it broke down in 1883.<sup>1</sup> In 1885 the coke cartell was renewed for five years both as a price and production cartell under the name of the Association of Coke Works and "Fettkohlen" Mines of the Mining District of Dortmund. As Huckinghaus says they "took their task in earnest" and proceeded to establish a more solid combination than had previously existed, both as to the terms of agreement and the organization for putting it into effect.<sup>2</sup> The agreement had stipulated that 85% of the production should be included ; as a matter of fact only 70% came in so that the combine was confronted with a formidable competition. A contraction of 30% was established and prices were maintained until the end of 1886 (though they were very low prices). But when it was seen that they were merely giving the outsiders a chance to increase production at their expense they removed all restrictions on production and price.<sup>3</sup> The immediate result was violent competition and a sharp fall in prices. The cartell continued in formal organization but did not

<sup>1</sup> See Statutes in *Enquete*, pp. 760-7.

<sup>2</sup> Cf., *Bochum Hk.*, 1884, etc. Full text of agreement in *Enquete*, pp. 768-772 ; Gruner, pp. 17-22.

<sup>3</sup> *Bochum Hk.*, 1885, p. 9 ; 1886, p. 8.

attempt to perform the functions for which it was created. Coke fell from 7-7½ to 5-5¼ m. per ton.<sup>1</sup>

The cartells having failed to put the coal industry on a satisfactory basis, and the situation becoming rather worse than better, the Verein determined to see what could be done in another direction. The great waste involved in a multiplicity of small uncoördinated mines had already attracted attention in 1885, and the executive committee of the Verein appointed a commission to investigate the subject from technical and financial standpoints. The commission reported strongly in favor of extensive consolidation, and recommended that this be carried out on the basis of four regional groups. It was easy for the commission to prove that great economies could be attained by consolidation, and as a matter of fact the process had already begun in the case of individual managements, and, while the plan of the commission had no direct fruit, the systematic consolidations achieved by such mines as Harpen, Gelsenkirchen and Hibernia in the years immediately succeeding was almost equivalent.

Another promising effort which proved, however, unsuccessful and indeed illegal, was that by which a limitation of production was sought to be obtained by compulsory methods. There existed an institution known as the "Berggewerkschaftskasse," intended to promote the mining interests of the district, to which all mines were legally obliged to make contributions. The proposal now made and adopted was to levy these contributions on the proceeds from production above a certain amount.<sup>2</sup> The scheme was never actually enforced,<sup>3</sup> and the courts subsequently declared it illegal.

<sup>1</sup> *Bochum Hk.*, 1886, p. 8.

<sup>2</sup> Statutes given in part in Gruner, pp. 4-13.

<sup>3</sup> Kirdorf, *Cent. Verband D. I.*, 1901, p. 224.

The Verein pursued its aims in spite of failures. In 1887 the chairman, Dr. Hammacher, submitted a plan to the members for the establishment of a company which should have the sale of the entire Ruhr district in its hands. A commission of the Verein made a favorable report and proposed a detailed scheme of organization, the essential feature of which was the formation of an extraneous company with 25 millions capital which should make a contract with the mines for the exclusive sale of the product and for which the company should make stipulated payments. This plan failed to receive approval because the general opinion prevailed among the mine owners that they could do just as well without the help of the selling company.

The coke producers, fewer in number and with greater identity of interest, were more successful. The cartell already in existence, but *hors du combat*, did not satisfy them, and in 1887 a plan was formulated to organize a selling company composed of all the coke producers as shareholders with detailed regulations as to prices, etc. This plan received the assent of 90 per cent of the production in 1887, and continued under consideration till in 1888, when 97 per cent agreed to it under a modified form, and it was put in force. This cartell was too weak to meet the needs of the situation.<sup>1</sup> It lasted, however, until 1890, when the present coke syndicate was organized (September 22, October 16) with 92 per cent. of the production,<sup>2</sup> under the title Actiengesellschaft Westfälisches Cokssyndicat, and took over the sole sale of coke.

The period of deep depression of the middle eighties

<sup>1</sup>*Jahresbericht d. Vereins*, 1888, p. 19; for text of statutes see Anlage, III; also Enquete, pp. 778-81.

<sup>2</sup>*Jahresb. d. Verein*, 1891, p. 17.

was followed by a period of general improvement, rising prices and speculative activity. The mine owners had at last an opportunity to sell all they could produce. The mine laborers, however, who had their grievances also took this occasion to strike.<sup>1</sup> Over the cause of the strike we need not dwell long here; the immediate cause was dissatisfaction with the conditions of labor, particularly the length of the shifts; the underlying cause, according to Oldenburg, was the transition from middle-sized to large industry.<sup>2</sup> The government had to interfere to keep order and to reconcile the parties. It had two consequences to be noted here (1) it tended to strengthen the movement of labor combination to oppose combinations of capital,<sup>3</sup> (2) it gave another impulse to the combination movement among the mine owners. Most of the coal mines of the district entered into a mutual insurance association for protection against loss through strikes (Feb. 13, 1890). One hundred mines representing 93.9% of the output of 1888 joined this society. The agreement provided for the payment of full compensation to those who suffered losses from strikes by no fault of their own.<sup>4</sup>

The next noteworthy step in the development of coal combinations came in 1890 and took a different direction. As the report of the Verein (1890, p. 7) says, it was seen that the time was not ripe for a general combination for the whole district. On the other hand local cartells might be formed and used as a basis for

<sup>1</sup>Schaeffle, *Trennung von Staat u. Volkswirtschaft*, p. 596.

<sup>2</sup>Schaeffle, *passim.*, Oldenburg, esp., p. 215; *Denkschrift über die Untersuchungen der Arbeiter- u. Betriebs-verhältnisse in den Steinkohlen Bezirken. Bochum Hk.*, 1888, pp. 11-18.

<sup>3</sup>Oldenburg, p. 215.

<sup>4</sup>For text of agreement see *Jahresbericht d. Verein*, 1889, p. 30, Anlage, V.

further combination. It seemed then that a few strong local cartells would be more serviceable than a weak general cartell. Carrying out this idea four local syndicates were formed embracing a large part of the production of the district. The first to be established was the A. G. Dortmunder Kohlenverkaufs Verein (Aug. 9, 1890) and the plan adopted was taken as a model by the local cartells subsequently formed, as well as the general cartell established three years later.<sup>1</sup> The plan was essentially similar to that of the coke syndicate established in the same year. The chief features were a selling company (Syndicat) composed of the coal producers who severally contracted to deliver their coal to the syndicate for sale receiving in return the proceeds therefrom. The mine-owners bound themselves to meet at regular intervals in order to make agreements concerning the amount to be produced and the prices for which the syndicate might sell it.<sup>2</sup> The Dortmund cartell included 3,000,000 tons; Harpener and Gelsenkirchen lying in the same district, though friendly did not join it.<sup>3</sup> A similar combination was formed soon after (Dec. 13, 1890) by mines in the Bochum district with an output of 4,000,000 tons. In the same month (Dec. 18, 1890) a third cartell was established at Essen with an output of 3,000,000 tons and finally at the beginning of the following year (Feb. 21, 1891) a fourth cartell embracing the mines of the Steele-Mülheim district with a production of about 1,000,000 tons was formed.<sup>4</sup> These four cartells together with the allied Harpener and Gelsenkirchen mines included about 75% of the output.

<sup>1</sup> Kirdorf. *Cent. Verband D. I.*, 1901, p. 225.

<sup>2</sup> For text of cartell, see Gruner, pp. 40-51.

<sup>3</sup> *Bochum Hk.*, 1890, p. 8.

<sup>4</sup> Gruner, p. 51; *Bochum Hk.*, 1890, p. 8.

One other cartell was formed at this time which requires a passing notice, namely, the Briket Verkaufsverein (Jan. 10, 1891). It soon came to embrace the whole output of the district. Its organization was similar to the Dortmund cartell described above.<sup>1</sup>

The *hausse* of 1889-90 proved to be of short duration; the new cartells had been formed just at the end of it, but they were not strong enough to prevent a rapid decline in the price of coal, though this does not show itself distinctly in the business of the mines, owing to the length of the terms of previous contracts. The reports of the Verein and of the Bochum chamber of commerce attribute a moderate success to them.<sup>2</sup> As long as the industry was organized in local cartells, it would seem, indeed, *à priori*, that the result would be an increase rather than a decrease in competition, and to a certain extent this appears to have been true. To remedy this danger a tentative step towards a more general combination, an association called the "Gemeinschaft," was established, Jan. 16, 1892, to which the four local cartells described above were signatory parties, together with twenty-four of the most important coal mines of the district, representing a production of about 31,000,000 tons, or over six-sevenths of the total output of the district. The organization was weak and attempted principally to get a harmonious determination of prices through meetings composed of producers of the different sorts of coal, the conclusions of which were subject to the ratification of the general assembly.<sup>3</sup> It was dissolved in Sept., 1892, before the term of the agreement had expired.

<sup>1</sup> *J. d. Verein*, 1891, p. 20; Gruner, p. 52.

<sup>2</sup> *Verein*, 1891, pp. 14-17; *Bochum Hk.*, 1891, p. 8.

<sup>3</sup> *Cf.*, Gruner, p. 53-5. *Bochum Hk.*, 1891, p. 8; 1892, p. 6.

In the meantime negotiations were being conducted with the aim of establishing an effective combination such as had already been achieved for coke. This was finally accomplished at a meeting held on January 22, 1893. Of the total production of the district 96.94 per cent. was considered eligible, but they succeeded in bringing in only 86.8 per cent.<sup>1</sup> This cartell established a selling company which took the title "Actiengesellschaft Rheinisch-Westfälische Kohlen-Syndicat." It was organized on a plan substantially the same as the Dortmund cartell of 1890; the details are given below.<sup>2</sup> The production of the Dortmund mining district in 1892 was 36,853,502 tons<sup>3</sup>; the production of the mines joining the syndicate for the same year was 31,975,642 tons<sup>4</sup>; their estimated capacity (1893) according to the syndicate treaty was 33,575,976 tons<sup>5</sup>. Thirty-one mines, mostly very small, with a total production of 1,254,945 tons did not come in (Mt. Ceniz, production 198,934 tons. came in shortly after), and besides these there were "smelter mines" (Hüttenzechen) with a capacity of 3,777,158 tons.<sup>6</sup>

The establishment of this cartel made several of the existing combinations superfluous, and they almost all disappeared before the end of 1895. This does not apply to the cartells of coal products, viz., coke and briquets, which have continued with very close relations to the coal cartell down to the end of 1903.<sup>7</sup>

<sup>1</sup> Kirdorf, *Cent. Verband D. I.*, 1901, p. 225.

<sup>2</sup> See p. 78.

<sup>3</sup> *Berg.-Hüt. u. Sal.*, 1894, p. 2.

<sup>4</sup> *Ztg. d. Oberschl. B. u. H. Vereins*, 1893, p. 18.

<sup>5</sup> *Bericht d. Rh.-Westf. Kohl. Synd.*, 1902, p. 6.

<sup>6</sup> *Ztg. d. Oberschl. B. u. H. Ver.*, 1893, p. 18.

<sup>7</sup> Cf. Gruner, pp. 76-7.



## CHAPTER II

### OTHER COAL CARTELS

Coal combinations, though they exist in other parts of Germany, have no such history as those of the Ruhr. The most important—that of Upper Silesia, founded in 1890, kept its operations so much from the public eye that some of the best informed writers seemed to be ignorant of its existence years after its formation.<sup>1</sup> Yet it was known to Grossmann in 1891<sup>2</sup>, and is mentioned in the annual report of the Breslau Chamber of Commerce in 1893.<sup>3</sup>

An association for the advancement of the interests of the mining and smelting works of the region was formed on the model of the Ruhr Verein in 1861.<sup>4</sup> This apparently satisfied the demands for combination, until the end of the eighties, and, considering the small number of producers and their social character, it is comprehensible that that might have been enough to procure a fairly good observance, tacit or expressed, of price agreements, etc. In 1888, however, a cartell was attempted, on the plan of the Kali Cartell, to include

<sup>1</sup> Cf. Renauld, [1900] "Von Oberschlesien ist nur ein Versuch zu einer Koalition in Jahre 1887 . . . bekannt, der an der Ablehnung des Beitritts der fiskalischen Werke scheiterte," p. 182, note.

Friedrich, (1902), apparently knew the situation, but conceals it in a vague sentence. "In Oberschlesien kam jedoch eine Koalition der Kohlenwerke nicht in dieser Form" [*i. e.*, Ruhr Syndicate] "zu Stande," p. 66.

<sup>2</sup> Grossmann: Ueber industrielle Kartelle. *Jahrbuch f. Gesetzgebung* etc., 1891, p. 240.

<sup>3</sup> *Jahresbericht der Handelskammer zu Breslau für das Jahr 1893*, p. 234.

<sup>4</sup> Oberschlesien berg- und hütten-männischen Verein, 1861. Cf. Verzeichnis der im Deutschen Reiche bestehenden Vereine gewerblicher Unternehmer. Berlin, 1903.

the fiscal mines, but failed on the refusal of the state to participate. It was accomplished in 1890 without them.<sup>1</sup>

The cartell in the present form dates from 1898, and is called the Oberschlesische Kohlenkonvention.<sup>2</sup> It was reported in the beginning of 1901, and even positively affirmed, that there was a movement towards the establishment of a so-called syndicate, and that the fiscal mines were the chief promoters of the project. At any rate it came to nothing.<sup>3</sup>

Since the production of the Saar is practically consolidated in the hands of the Fiscus, a cartell would have no meaning.

For the mines of the Waldenburg district (Lower Silesia), a Verein like that in the Dortmund district has existed since 1876.<sup>4</sup> There does not appear to have been any cartell, however, until within about a year. The *Industrie Zeitung* for May 16, 1902 reports the establishment of a selling syndicate called the Kohlenverkaufs-syndikat im Waldenburger Revier, which includes all the mines of the district and one Neuroder mine; this cartell has a term of five or six years, and does not include coke.<sup>5</sup>

In Saxony a Verein for mining interests in the Zwickau district was established in 1860.<sup>6</sup> A cartell seems to have been in operation for a part of this district for a good many years. (1885).<sup>7</sup> On April 1,

<sup>1</sup> Grossmann, p. 240.

<sup>2</sup> Cf. Enquete, p. 539. For detailed description see p. 104.

<sup>3</sup> *Industrie Zeitung*, 3 Jan., 1901, p. 3. 10 Jan. 1901, p. 16.

<sup>4</sup> Verzeichnis der im Deutschen Reich bestehenden Vereine gewerblicher Unternehmer, p. 96.

<sup>5</sup> *Industrie Zeitung*, May 16, 1902; Cf. Grunzel, p. 291.

<sup>6</sup> Verein für bergbauliche Interessen zu Zwickau i. S. Cf. Verzeichnis der im Deutschen Reiche bestehende Vereine etc., p. 97.

Enquete, p. 599.

1902 a production cartell called the "Zwickau-Oelsnitz-Lugan Convention" went into operation. The form is peculiar. A minimum price is fixed and the market is divided into three zones; in the first, where no outside competition exists no reduction is allowed, in the second, the price may be cut, but not over four marks, and in the third there is no limit placed on price-making.<sup>1</sup>

The brown coal industry has had a Verein since 1885—the "Deutsche Braunkohlen-Industrieverein";<sup>2</sup> and similar organizations exist for local interests, viz., Niederlausitz (1898), Magdeburg (1879), Rheinland (1893), Dresden (1898), and Leipzig (1895).<sup>3</sup> A cartell was established Nov. 20, 1896 for brown coal in the Magdeburg district which expired on Dec. 31, 1899, and was reorganized for five years.<sup>4</sup> Another brown coal cartell was formed in Saxony.<sup>5</sup> One of the most important of the brown coal cartells is the "Braunkohlen-Brikets-Verkaufs Verein" in Cologne; this cartell has been in operation several years, but was reorganized under the present title in 1902. Some of the provisions of its treaty are noteworthy. Section six of the treaty provides that briquet works cannot manufacture brikets with special label or brand to more than 50% of the total allowance; the rest are marked "Union." The special brands, further, must be sold at a higher price (by 10 m. per 10 tons), and the purchasers must agree to accept the "Union" brand in lieu of the same, if it is deemed necessary by

<sup>1</sup> Cf. Sayous, pp. 277-8.

<sup>2</sup> Verzeichnis der im Deutschen Reiche bestehenden Vereine etc. p. 97.

<sup>3</sup> *Ib.* pp. 97-8.

<sup>4</sup> Grunzel, p. 292; *Industrie Ztg.*, July 6, 1899, and "middle of January" 1898.

<sup>5</sup> Grunzel, p. 292.

the cartell in order to keep the works uniformly occupied.<sup>1</sup>

We may mention here also the existence of cartells in the by-products of the coal industry, namely, the "Deutsche Ammoniak-Verkaufs-Vereinigung"<sup>2</sup> (Bochum) which has been in operation since 1896, and has today 29 members, besides selling agencies for gas works in seven cities, etc.<sup>3</sup>; The Deutsche Theer-Verkaufs-Vereinigung which has been in operation since 1898, and includes 24 members; and the Westdeutsche Benzol-Verkaufs-Vereinigung which includes twenty members.<sup>4</sup>

<sup>1</sup> Cf. Cartell treaty in Laur, pp. 304-18.

<sup>2</sup> Gruner, p. 77; *Bochum Hk.*, 1901, p. 121.

<sup>3</sup> *Steinkohlenzechen*, 1903, p. 110.

<sup>4</sup> *Id.* 1903, pp. 111-113; *Bochum Hk.*, 1901, pp. 124-5.

## CHAPTER III

### HISTORY OF THE OPERATION OF THE COAL AND COKE SYNDICATES OF THE RUHR

Even more important than the history of the formation of the cartells is the history of their operation. Both on account of the nature of the material available and the importance of their affairs the coal and coke syndicates of the Ruhr present the best field for study.

In the following pages we shall treat of them according to this order, (1) the operations of the coke syndicate from 1890 to 1895, (2) the beginnings of the coal syndicate, 1893-1895 (3) the operations of the coal and coke syndicates from 1895 to 1900—the *hausse* period, (4) the coal famine and the crisis—1900, (5) the coal and coke syndicates during the hard times, 1901-1902.

*The Coke Syndicate 1890-1895.* The coke syndicate was established on Sept. 16, 1890, and shortly after its organization it embraced 98.5% of the output of the district excluding smelter coke-works.<sup>1</sup> At that time German industry had just reached the end of a short but vigorous boom. The iron trade—the barometer for coke production—had been enjoying a large business at profitable prices, and coke prices went up with them. The average Dortmund price<sup>2</sup> for Bessemer iron in 1890 was 79.8 m., and Thomas iron 61.0 m., while blast furnace coke had been up to 29.75 m. in February, and averaged 19.78 m. for the year.<sup>3</sup> The market was not so strong as it looked from current prices, and this undoubtedly led the coke syndicate to adopt a very

<sup>1</sup> Extracts from Memoirs of the coke syndicate, in *Dortmunder Jahrbuch*, 1901, p. 554.

<sup>2</sup> *Vierteljahrshefte*, 1902, p. 20.

<sup>3</sup> *Essen Hk.*, 1902, I, p. 71; 1890, I, p. 33.

moderate policy at the start. At any rate blast furnace coke was sold at 13.50–14.00 m. for the rest of the year.<sup>1</sup> The official price (Verrechnungspreis, see p. 000) was fixed at 13.00 m.<sup>2</sup> Owing to the existence of previous contracts, the syndicate did not get control of the situation until the following year.

The period from 1891–5 may be summed up as follows: The iron trade showed great weakness; although there was a steady increase in production (from 4,641,217 tons in 1891 to 5,380,038 tons in 1894<sup>3</sup>) prices fell decidedly; in 1891 Bessemer was 62.1 and Thomas 49.5, and by 1895 they had dropped to 52.0 m. and 45.6 m. respectively.<sup>4</sup> Until 1894 a heavy depression existed in the raw iron trade.<sup>5</sup>

The coke syndicate, as said above, really began work in 1891; its production in that year was 2,855,000 tons, out of a total production for the Ruhr district of 3,937,773 tons.<sup>6</sup> In order to meet the demand, a considerable contraction of the theoretical capacity was required. In the following years the production increased steadily, and in 1894 reached 4,736,195 tons,<sup>7</sup> although a contraction of production existed each year, (13% in 1892, in 1894, only 5%).<sup>8</sup>

The average prices of blast-furnace coke corresponded with the official prices of the syndicate; 13.50 m. in 1891, 12.00 m. in 1892, and 11.00 m. for the two follow-

<sup>1</sup> *Essen Hk.*, 1890, I, p. 33.

<sup>2</sup> Enquete, p. 793.

<sup>3</sup> *Stahl u. Eisen*, 1902, p. 341.

<sup>4</sup> *Vierteljahrshefte*, 1902, I, p. 20.

<sup>5</sup> Kestner, *Die deutschen Eisenzölle*, p. 41.

<sup>6</sup> Rept. of syndicate in *Bochum Hk.*, 1891, p. 11.

<sup>7</sup> *Id.* 1894, p. 11.

<sup>8</sup> *Id.* 1892, p. 9; 1894, p. 11.

ing years.<sup>1</sup> The reductions made were concessions to the iron trade which complained of the high coke prices although the fall in iron prices was proportionately less. The coke producers, besides lowering the domestic prices, were forced to seek outlets in an increased export trade at low prices.<sup>2</sup> In order to stimulate the home consumption, recourse was had in 1892 to a system of export bounties paid to the raw iron producers of Siegerland at the rate of 1.50 m. per ton of exports.<sup>3</sup> The establishment of the coal syndicate in 1893 helped to strengthen those mines belonging to the coke syndicate, as well as to improve the general tone of the market. Another very important event was a deal with the Belgian coke syndicate providing for a division of the field—chiefly in the foreign market. The coke production of the Aachen district was practically merged with that of the Ruhr.<sup>4</sup>

*The Beginnings of the Coal Syndicate.* The Rhenisch-Westfälische Kohlen Syndicat began operations formally on March 1, 1893, but it did not undertake the sale of coal until August 1 of the same year, and, as most of the product was already contracted for, the first year permitted it to do very little business beyond administrative organization. The sales for the year were only 2,769,077 tons, while the amount shipped by the syndicate mines was 8,643,853 tons.<sup>5</sup> The only influence the syndicate could exercise was through the contraction of production; the projected contraction was 15%,<sup>6</sup> the

<sup>1</sup> *Essen Hk.*, 1902, I, p. 71.

<sup>2</sup> *Bochum Hk.*, 1892, p. 7.

<sup>3</sup> *Id.* 1892, p. 9; 1894, p. 11.

<sup>4</sup> *Id.* 1894, pp. 8–11.

<sup>5</sup> Rept. of syndicate in *Essen Hk.*, 1893, II., p. 8.

<sup>6</sup> *Bochum Hk.*, 1893, p. 7.

actual contraction only 12%.<sup>1</sup> The syndicate got a good reception from the start from its customers.<sup>2</sup> This was due largely to its price policy, the moderation of which allayed their fears. This moderation was partly a necessity owing to the unfavorable market situation, but also intentional.<sup>3</sup> The prices were undoubtedly quite low. The average annual quotations on the Börse in Essen for the principal sorts, run of the mine, were as follows,<sup>4</sup>

	<i>Gas</i>	<i>Gasflamm</i>	<i>Fett</i>	<i>Mager</i>
1893.....	9.79 m.	7.58 m.	7.29 m.	7.50 m.

These were considered inadequate even by the moderate element.<sup>5</sup> In comparing prices, it will be convenient to use the Essen prices above quoted, and also the standard prices or price norms (Richtpreise, see p. 83) which are the basis for price making by the syndicate. Some of these norms at this date were, Fettkohlen (run of the mine) Fettförderkohlen 7.00 m., Gasflamm förderkohlen 8.00, m., Fett-Nuss I, 10.50 m., Kokskohlen (coking-coal) 5.50 m.<sup>6</sup>

The second year of the coal syndicate (1894) gives a better picture of its activity and functions. The industrial and produce market remained unfavorable, although there was a general advance in the stock market.<sup>7</sup> The coal stocks in particular advanced decidedly, which was unquestionably due to the successful operation of the syndicate. That the syndicate operated success-

<sup>1</sup> *Cent. Verb. D. I.*, 1901, p. 229.

<sup>2</sup> Rept. of syndicate in *Essen Hk.*, 1893, Th. II., p. 9.

<sup>3</sup> Effertz, 1894, p. 5.

<sup>4</sup> *Essen Hk.*, 1902, I., p. 71.

<sup>5</sup> Kirdorf. *Cent. Verb. D. I.*, 1901, p. 234.

<sup>6</sup> Denkschrift, Anlage 2.

<sup>7</sup> *Dortmund Hk.*, 1894, p. 12; *Bochum Hk.*, 1894, p. 5; *Essen Hk.*, 1894, p. 12.



fully from a stock market point of view was evident from the course of prices. 'The price norms had been advanced from .50 to 1.00 m. per ton', while the quotations on the Essen Börse showed a corresponding gain. These prices, however, by no means represented a completely satisfactory scale in the minds of the coal producers. Effertz, in his *brochure* in 1895, declared that in the preceding year about half of the mines worked without profit.<sup>3</sup>

The first annual report of the syndicate gives some interesting details of the organization of the new company. The selling business was divided into seven departments, according to the kind of coal, with a staff of one hundred eleven employees. There were also departments for book-keeping, statistics, administration, etc., and a body of legal counsellors, in all two hundred thirty-seven persons. A building for its use was supplied by the city of Essen.<sup>3</sup>

As a good many of the contracts previous to the establishment of the syndicate did not expire till April 1, 1894, the syndicate did not sell much the first three months (16.94%). At the inauguration of the syndicate, on Mar. 1, 1893, the total participation figures, or ideal capacity of the syndicate, had been fixed at 33,575,976 tons, but at the beginning of 1894 it had increased by 5.81% to 35,531,116 tons, and at the end of that year stood at 37,988,233 tons. The syndicate established a check on a too rapid increase by a contraction of the output. The projected contractions, fixed from time to time, amounted to 11.75% of the capacity,

<sup>1</sup> Denkschrift, Anlage 2; see p. 000.

<sup>2</sup> Effertz, 1895, p. 15; cf., also, Kirdorf, *Cent. Verb. D. I.*, 1901, p. 234.

<sup>3</sup> Rept. of syndicate in *Essen Hk.*, 1894, II., pp. 5-7.

but the actual contractions really amounted to much less, namely 4.98%. As the annual report remarks, "the power of restraining production possessed by the syndicate is of a temporary character, and it is impossible to permanently limit the productive capacity." The organization and control of the coal trade was begun at this time.

*The Coal and Coke Syndicates during the Hausse.* The year 1895 marked the welding together of the coal and coke syndicates,<sup>1</sup> and a prolongation of the term of the former until 1905. The alliance of the two syndicates did not destroy the identity or individual policy of either of them, but it centralized and simplified the duties of administration and sale, and brought them into an organic connection more nearly corresponding to their community of interests. The Briket-Verkaufs-Ver-ein was attached to the coal syndicate at this time also.

The period of 1895-99, inclusive, had a distinct unity as a period of very rapid development in German industry, particularly in coal and iron, and one which was marked by a strong advance in prices, culminating at the close in remarkable speculative activity, and brought to an end by the crisis of 1900.

For the coal and coke trade, the position of the iron industry was of critical importance, and the main facts in the situation are shown in the production and prices of raw iron. The iron production of 1895 was 5,464,501 tons, and thereafter it showed a prodigious and uninterrupted increase until 1899, reaching in that year a total of 8,143,132 tons.<sup>2</sup> The average price of Dortmund Bessemer iron was 52.0 m. in 1895, and Thomas iron was 45.6 m.; the average annual prices increased

<sup>1</sup> See p. 000.

<sup>2</sup> *Stahl u.-Eisen*, 1902, p. 341.

steadily, and in 1899 were 65.4 m. and 58.5 m. respectively.<sup>1</sup>

The coal production of Germany, also, showed a very large increase in this period, advancing in round numbers, from 79,169,000 tons in 1895 to 101,640,000 tons in 1899;<sup>2</sup> the corresponding figures for the Ruhr district were 41,734,000 tons and 55,072,000 tons. The coal syndicate kept pace with the general movement, producing 35,347,000 tons in 1895, and 48,024,000 tons in 1899.<sup>3</sup> The production, however, did not equal the productive capacity, as measured by the allowances of participation,<sup>4</sup> which amounted, in round numbers, to 37,988,000 tons at the beginning of 1895 and 53,559,000 tons at the end of 1899, but the steady improvement of the coal market made it possible to reduce and finally to abolish the restrictions imposed on production, in 1895, 12.08 %, in 1899, 3.75 % for the year (with free production during the last three months) though the mines, generally were allowed to produce more than was planned in the first part, and in 1899, when production was practically free, they were unable to equal their supposed capacity.<sup>5</sup> The demand, in fact, exceeded the productive power, and the country was confronted with a scarcity of coal (Kohlennot).

The advance in prices was as decided, if not as great, as the increase in production, and this could hardly have been otherwise, even if there had been no coal syndicate, when the character of the market is taken

<sup>1</sup> *Vierteljahreshefte*, 1902, I, p. 20. Thomas iron shows a small decline in 1898, but puddled iron an increase.

<sup>2</sup> *Stat. Jahrbuch*, 1903, p. 46.

<sup>3</sup> *Bericht d. Rh. W. Kohlen-Synd.*, 1902, p. 11.

<sup>4</sup> *Id.*

<sup>5</sup> Reichstag, 1902, p. 6139.

into account. The average annual quotations on the Börse in Essen for the principal sorts of coal, run of the mine, were<sup>1</sup>

	<i>Gas</i>	<i>Gasflamm</i>	<i>Fett</i>	<i>Mager</i>
1895-----	10.13 m.	8.33 m.	8.00 m.	7.50 m.
1899-----	11.75 "	9.13 "	9.37 "	8.88 "

With the exception of Gasflammförderkohle in 1896, these advances were uninterrupted for the annual average. The advances in market quotations followed naturally from advances in the price norms. As typical of these we may cite:<sup>2</sup>

	1895	1897	1899
Gasflammförder,-----	8.50 m.	9.25 m.	9.75 m.
Fettförder,-----	7.50 m.	8.60 m.	9.10 m.
Fett-Nuss, I,-----	11.00 m.	11.00 m.	11.50 m.
Kokskohlen,-----	6.50 m.	7.00 m.	8.50 m.

The price advances were defended, irrespective of market conditions, by the fact of increasing costs, and it was claimed, not without reason, that if the syndicate had not existed, the prices would have advanced more rapidly and higher. The moderate party in the syndicate appears to have had control up to 1898, when after a sharp and somewhat acrimonious struggle in the general assembly, the radical party won the day.<sup>3</sup> The autumn of 1899 brought another struggle in which the radical party again won the victory and made a price advance which did not take effect, however, until the following year. Those who had defended the cartell *régime* both in coal and other products, as being a guarantee of a moderate price policy and steady prices, found this somewhat radical movement unwise and injurious. The Bochum chamber of commerce, for ex-

<sup>1</sup> *Essen Hk.*, 1902, I, p. 71.

<sup>2</sup> Denkschrift, Anlage 2.

<sup>3</sup> Cf. *Cent. Verb. D. I.*, 1901, p. 235. Herr Kirdorf, the chairman, called the "apostle of moderation," was accused of a careless neglect of the interests of the cartell.

ample, raised a warning cry against excessive price advances, at the same time defending the cartells generally and in principle.<sup>1</sup>

Just at the close of 1899 a coal famine appeared which lasted into the following year and may be better described there. The insatiable demand led the syndicate not only to remove all restrictions on production, but also to cut down its exports which actually showed a decrease during the year 1899 in spite of a good demand.<sup>2</sup> Even then it had to buy coal abroad in order to fill all its contracts.<sup>3</sup>

The history of the coke syndicate for the period 1895-99 is in the main lines the same as the coal syndicate. Even more than the coal producers, the coke producers depended for their prosperity on the situation of the iron trade, and it was precisely during this period that the German development of iron production assumed such proportions as to attract the attention of the whole commercial world. Only in one year, 1898, was there any evidence of weakness, but this was followed by a strong recovery.

For the production of coke in Germany, the Ruhr district is decisive; this had increased, in round numbers, from 5,563,000 tons in 1895, to 8,202,000 tons in 1899.<sup>4</sup>

<sup>1</sup> *Bochum Hk.*, 1898, p. viii, (written in 1899). "Wenn in letzter Zeit die Preise vielfach sehr stark und stellenweise wohl auch uebermässig heraufgesetzt worden sind, so ist das sehr bedauerlich, und wir gehalten uns für verpflichtet, hier warnend unsere Stimme zu erheben; aber wir meinen doch, eine schwere Anklage deswegen gegen das gesamte deutsche Kartellwesen zu schleudern, ist nicht angängig, denn darüber kann im Ernst doch auf keiner Seite ein Zweifel bestehen, dass ohne den mässigen und regulierenden Einfluss dieser Verbände die Entwicklung viel überhasteter vor sich gegangen und die Preissteigerung eine viel stärkere gewesen wäre, so dass wir uns schon längst in einer schweren Krisis befinden würden."

<sup>2</sup> Rept. of syndicate in *Essen Hk.*, 1899, II, pp. 6-11.

<sup>3</sup> *Bochum, Hk.*, 1899, p. 52.

<sup>4</sup> *Dortmunder Jahrb.*, 1901, p. 581.

Of this the coke syndicate had produced 4,821,787 tons, or 86.7 %, in 1895 and 7,045,923 tons, or 85.9 %, in 1899.<sup>1</sup> The slight decline in the proportion of the syndicate was due to the increase of the coke plants of the independent smelter mines (Hüttenzechen).<sup>2</sup> The production of iron in Germany and Luxemburg increased between 1895 and 1899 about 49 %, while the production of the coke syndicate increased about 46 %. The market of the coke syndicate, however, was not coterminous with the region of iron production of Germany and Luxemburg, and it would be difficult to delimit its normal field of supply. That there was no decided attempt to restrain production appears from the fact that the proportion of the syndicate output did not materially diminish, and also because the contraction of productive capacity was not great during any year of this period.

The course of coke prices on the Börse in Essen shows a steady increase from an average of 11.00 m. for blast furnace coke in 1895, to 14.37 m. in 1899.<sup>3</sup> These corresponded to normal prices of 11.00 m. and 14.00 m. respectively.<sup>4</sup>

During this period there was great steadiness in price, but a considerable fluctuation in activity in producing and marketing coke. Thus in 1895 a restriction was imposed as high as 19 % in the earlier months of the year, while at the end the ovens were run to their full capacity.<sup>5</sup> On the other hand, in 1897 the coke syndi-

<sup>1</sup> *Dortmunder Jahrb.*, 1901, p. 581.

<sup>2</sup> Cf. Reports of coke syndicate.

<sup>3</sup> *Essen Hk.*, 1902, I, p. 7.

<sup>4</sup> Enquete, p. 973.

<sup>5</sup> Report of syndicate, 1895, in *Bochum Hk.*, 1895, p. 9.

cate bought coke in England in order to fill its orders.<sup>1</sup> The most eventful year was 1899 which is described as being extraordinarily lively for the iron trade<sup>2</sup> with great scarcity of coke. Coke production was unrestricted throughout the year, but the demand was so great that it gave speculative dealers a chance to run up the prices. In order to prevent them from exploiting the consumers unfairly, the syndicate extended its direct sales to all who took a minimum of 500 tons per annum.<sup>3</sup>

Another very important event in 1899 was the formation of the so-called two year fusion contracts. The practice of making contracts of sale long in advance of the period of production had led the coke syndicate to sell its output for 1900 in the spring of 1899, and indeed, at the price of 14 marks then prevailing. The energetic demand for coke led the radical element to think that they had sold altogether too cheap, and a movement was put on foot to practically cancel these contracts and to substitute a two year contract (*i. e.*, for 1900-1901) with a price of 17 marks. On the principle of charging what the market would bear, the price of 17 marks appeared fairly moderate in the fall of 1899, but many of the iron manufacturers did not like the idea of a two-year contract, nor were they anxious to give up their favorable contracts at 14 marks for 1900.<sup>4</sup> The coke syndicate in its report for 1899 says: "The security of the coke supply united with the unitary determination of a moderate average price for the iron industry guarantee for the latter a calm and

<sup>1</sup> Rept. syndicate, in *Ztg. Oberschl. B.-H. V.*, 1897, pp. 201-2.

<sup>2</sup> *Stahl u. Eisen*, 1902, p. 341; *Essen Hk.*, 1899, p. 8.

<sup>3</sup> Bericht d. Cokssyndicat, 1899, p. 4.

<sup>4</sup> Enquete, pp. 646-80.

equable development for the next two years."<sup>1</sup> Unfortunately for the iron industry, the prediction proved utterly untrue, and the bad example of the coke syndicate was followed with even more unfortunate consequences by the iron producers.<sup>2</sup>

From their beginnings and throughout this period also, it was the practice of both the coal and the coke syndicates to conduct their exports at the common expense. That is to say the losses from the sales made by either syndicate below the normal prices did not fall on the individual company whose product was sold, but upon the general account, and this expense was covered by an assessment on all the companies. An indication of how great these amounts were will be considered in detail later. In a similar manner, the syndicates sought to increase the consumption of their products by encouragement to the iron industry for the development of its export business. Thus it appears that in 1897 the coal syndicate, in combination with the iron syndicate and Halbzeugverband (*i. e.*, cartell of half-finished goods such as ingots, etc.) gave to their consumers a bounty of 15 m. per ton exported.<sup>3</sup> The coke syndicate continued to give similar bounties to those already mentioned for 1892, and in 1897 paid out a special bounty of 600,000 marks to the foundry iron syndicate to enable it to meet English competition in Germany.<sup>4</sup>

*The coal famine and the crisis—1900.* The year

<sup>1</sup> Bericht d. Cokesyndicat, 1899, p. 3.

<sup>2</sup> Cf. Calwer, 1901, p. 31.

<sup>3</sup> Oeser, p. 14.

<sup>4</sup> Cf. Rept. of syndicate in *Bochum Hk.*, 1895, p. 9; *Ib.* in *Ztg. d. Oberschl. B.-H. V.* 1897, pp. 201-2.



1900 was a very remarkable one in the history of the coal industry. It was characterized by two very incongruous events, namely, an extraordinary demand for coal and an industrial crisis. The first was an almost fortuitous and relatively insignificant event, but perhaps it excited more fear and caused more denunciations of the coal interests, and particularly the syndicates, than the more serious but more doubtful influence of its price policy on industry.

The coal famine began in the autumn of 1899. The winter started in cold, giving a strong demand for house fuel, while industrial consumption had almost reached its zenith. The demand, therefore, was unusually great. On the other hand, the usual sources of supply were not available to their full extent, for though the production of the mines had increased, there was a great scarcity of cars<sup>1</sup>, and importations from England were hindered by circumstances arising out of the Transvaal War, and from Bohemia by strikes.<sup>2</sup> There was a strike in Saxony also. The syndicate mines, naturally, were allowed to run to their full capacity.<sup>3</sup> The real shortage of supply from a technical standpoint was overcome by April, 1900, but the rise in retail prices, and the difficulty of getting coal, had created a panic. The situation was made much worse, on the one hand, by extravagant over-bidding on the part of consumers who also demanded more than normal quantities, and on the other hand, by engrossing and running up of prices by the dealers

<sup>1</sup> *Industrie Ztg.*, 1900, pp. 27-8, 41; *Stahl u. Eisen*, 1900, pp. 155-8.

<sup>2</sup> The importation of brown coal from Austria fell from 6,166,543 tons in Feb. 1899, to 501,148 tons in Feb. 1900. This compelled many concerns in Saxony to shut down. *Calwer*, 1900, pp. 83-4.

<sup>3</sup> *Cent. Verb. D. I.*, 1901, p. 230.

and casual speculators. According to the contemporary record of the *Industrie Zeitung*, on the basis of a syndicate price of 112 to 122 m. per 10 ton carload, the price in April had been run up to 220 to 240 m.<sup>1</sup> The rise in price was international in character and was by no means confined to the Ruhr or to Germany.<sup>2</sup>

The blame for these exorbitant prices was generally laid on the dealers, though the syndicates came in for a share of it. The Prussian government gave notice on Sept. 7 that the "raw stuff" railway rate would be allowed to imported coal for at least two years, but it refused to set aside the special export rate for coal.<sup>3</sup> In the autumn, people were still anxious about the coal supply, though those acquainted with the situation, especially in view of the changed *conjunctur*, were looking forward to a decline in consumption. The opportunity was not lost to bring the matter to a parliamentary debate in the Reichstag (Dec. 3, 1900),<sup>4</sup> and resolutions were brought in against cartells in general but aimed at the coal syndicate in particular. When therefore, as though in answer to the criticisms that had been heaped upon it, the Ruhr syndicate announced a contraction of production for the ensuing year, it called forth widespread indignation.<sup>5</sup>

In Jan., 1901, when the trouble was actually over, the Prussian Abgeordnetenhaus appointed a commission to investigate the subject. They reported that there had been a real scarcity (which some had denied), and that great abuses had existed in the retail trade, both as to prices and quality, but that it was a fortui-

<sup>1</sup> *Industrie Ztg.*, 1900, p. 178 (April 5).

<sup>2</sup> Cf. Savage, p. 39.

<sup>3</sup> Calwer, 1900, pp. 84-5; *Industrie Ztg.*, Sept. 9, 1900, p. 405.

<sup>4</sup> Stenogr. Berichte des Reichstags, 1900-1902, I, pp. 274, *et seq.*

<sup>5</sup> Calwer, 1900, p. 88; Sayous, p. 155.

tous event, and its recurrence was not to be anticipated. The principal causes that contributed to the panic, apart from technical difficulties of supply, are said to have been (1) an unsound condition of the market (over-stimulated demand), and, (2) a badly regulated system of selling. So far as the syndicates were concerned, they were neither blamed nor exonerated, but that the attitude of the commission was not hostile to them may be judged from the fact that they proposed fiscal participation in the Silesian Convention.<sup>1</sup>

The syndicate in its annual report for 1900<sup>2</sup> defended itself against the charge of having caused the coal panic. After having described the facts regarding the coal trade during the year, it concludes—"The reasons for this striking phenomenon lay in the over-estimation of consumption." It claimed that the syndicate, as producer of only one-half of the supply of the kingdom, could not be blamed for the coal famine, especially as their proportion of the total production had increased, not only in 1900, but in every year since 1895. Referring to a table showing these facts, the report says:—"These figures disprove anew the assertion which keeps appearing in spite of frequent confutation, and which is advanced with a *tendenziöser* purpose, that the production of the mines combined in the syndicate is artificially held back by the policy of the syndicate." The fact that the output was not equal to the participation figures, the syndicate meets with the assertion that free rein was given to production, and the deficiency simply showed that the technical capacity of

<sup>1</sup> Haus der Abgeordneten 19 Legisl. III, Session 1901. Bericht der X Kommission . . . betreffend die Miss-stände bei dem Verschleiss der Kohlenproduktion, Nr. 12 der Drucksachen.

<sup>2</sup> Bericht d. Rh. W. Kohlen Syndicats, 1900.

the mines was in many cases fixed too high. On the other hand, some mines greatly exceeded their participation.

Of vastly greater importance, though not so quick to excite public apprehension, was the development of a sharp crisis which was followed by a long period of industrial weakness in the succeeding years. The duration of the good times had exceeded all expectations, but whereas at first the continuance of prosperity had been regarded as rather dubious, opinion had gradually come around to the opposite point, so that it was hard to convince many that the era of prosperity was over. Some warning voices had been raised in 1899, but they had not been heeded. The first clear evidence appeared in April, 1900, on the Börse in Berlin; at the end of the month the *hausse* party was decisively beaten, and a decline developed gradually into a general *déroute*.<sup>1</sup> Under these circumstances, a good many weak concerns went under in the mining and smelting industry. Differdingen-Dannenbaum and Aumetz-Friede got into difficulties; one of the big electrical companies failed. Worse still, certain financial institutions as they went down, revealed a situation which tended to shock credit and to discourage investment. This was the case notably in the Pommerschen Hypotheken Bank, and in the following year, in the Leipziger Bank and its *protégée*, the Trebertrocknungs A.G. in Cassel,<sup>2</sup> concerning which criminal processes long occupied the courts. The industrial market was almost as quick to mark the change as the Börse. Prices had been rising rapidly especially in iron goods in the first months of the year, but when the crisis developed in April, orders for iron goods were

<sup>1</sup> Calwer, 1900, p. 18.

<sup>2</sup> *Bochum Hk.*, 1900, p. III.

cut down or cancelled, and in the non-cartelled lines, or those in which the organization was weak, prices fell heavily. The iron and Halbzeug cartells maintained prices for a time but wire, plates, and pipes declined rapidly after the middle of the year.<sup>1</sup>

For the powerful coal syndicate the severe crisis had no peril. The coal famine kept production to the limit of capacity, and from the point of view of the coal market, the crisis year was extraordinarily favorable.<sup>2</sup> The only dangers appeared in the political horizon—in the demands for a prohibition of coal exports, for withdrawing favorable export rates,<sup>3</sup> and in the general attacks on the cartells, as for example, Frhrr. v. Heyls' resolution in the Reichstag which was aimed at the coal syndicate.<sup>4</sup> These perils did not intimidate its leaders, who, continuing their previous policy, determined to contract production to meet the decrease in demand. Some of the staunchest supporters of the cartells (and in particular of the coal syndicate) showed some signs of anxiety and doubt about the price policy at the beginning of the crisis. The Bochum chamber of commerce said: "Prices have reached an elevation which finally must lead to a limitation of consumption. Already a part of the "working-up" industries have not been able to bring selling prices into harmony with the increasing price of materials . . . . It is best for industry when sharp contrasts in the course of business and earnings are avoided. A small, slowly accomplished price reduction would tend to establish the duration of the present *conjunctur*, which till now has shown itself thoroughly

<sup>1</sup> *Bochum Hk.*, 1900, *passim*; *Essen Hk.*, 1900, pp. 9-10.

<sup>2</sup> *Bochum Hk.*, 1900, p. 67.

<sup>3</sup> *Industrie Ztg.*, Sept. 9, 1900, p. 405; Sept. 27, p. 434.

<sup>4</sup> *Cent. Verb. D. I.*, 1901, pp. 29, 205.

sound".<sup>1</sup> The coal syndicate, however, which had just gone on to a scale of higher prices held to them. The price norms had been increased generally from 1 to 1.25 marks; Fettförder from 9.10 to 10.10 marks, Gasflamförder from 9.75 to 10.75 marks, Fett-Nuss I from 11.50 to 12.75 marks, Kokskohlen from 8.50 to 10.50 marks.<sup>2</sup> The market prices as shown by the Börse in Essen were,<sup>3</sup>

	Gas	Gasflamm	Fett	Mager
1900-----	12.75 m.	10.00 m.	10.25 m.	9.50 m.

The attacks on the price policy of the coal syndicate were not left unanswered. The "Dortmunder Verein" published a special *brochure* reviewing the situation and analyzing the organization and policy of the syndicate.<sup>4</sup> The annual report of the syndicate justified its price policy by a comparison of its prices with those of other districts of Germany and of foreign countries, in which they were able to show that prices in the Ruhr had been generally as low and in most cases much lower than elsewhere. It was admitted that in the wholesale and retail trade prices had been unduly raised, but the report declared—"The syndicate had no share in this over-stimulated price-making."<sup>5</sup>

The crisis year was even more lucrative for the coke syndicate. Its whole output almost had been sold in advance at a high price. Though the manufactures of iron led the way in the general slump of the market, raw iron, on which the coke industry depended, maintained its prices and produced the "record" tonnage to

<sup>1</sup> *Bochum Hk.*, 1899, p. 63 (written in 1900).

<sup>2</sup> *Denkschrift*, Anlage 2. About 70% of the output was advanced 1.00 m. *Ib.*, p. 13.

<sup>3</sup> *Essen Hk.*, 1902, I, p. 71.

<sup>4</sup> *Denkschrift betr. die Verhandlungen des Deutschen Reichstages über die Kohlenfrage*. Essen, 1901.

<sup>5</sup> *Bericht d. Rh.-W. Kohlen Synd.*, 1900.

that date, namely, 8,520,540 tons.<sup>1</sup> Under the two year "fusion" contract, coke was sold for nearly the whole supply at 17 m., but for current sales the market of 1900 showed much higher figures, and the average for the year on the Börse in Essen for blast-furnace coke was 21.29 m.<sup>2</sup> Production was pushed to the limit of capacity and reached a total amount of 7,786,347 tons, an increase of 10.5 % over 1899.<sup>3</sup> A very significant feature of the situation was the extraordinary increase of coke production of the works owned by the Hüttenzechen from 937,367 tons in 1899, to 1,465,510 tons in 1900, an increase of 56.3 %. The report of the coke syndicate claims that the crisis cannot be attributed to the policy of the syndicate in raising prices, and points to the satisfactory profits of their customers, the blast furnaces. It also declares that owing to the strong domestic demand coke exports were limited to pre-existing contracts.<sup>4</sup>

*The Coal and Coke Syndicates during the hard times, 1901-1902.* The crisis of 1900 continued in the following years producing what are generally called hard times, the burden of which, however, was very unevenly divided among the industries of the country, and can scarcely be said to have fallen at all on the coal and coke syndicates. At the beginning of 1901, some still hoped for and proclaimed a quick recovery,<sup>5</sup> but others were convinced that the market was more permanently shattered and found the cause therefor

<sup>1</sup> *Stahl u. Eisen*, 1902, p. 341.

<sup>2</sup> *Essen Hk.*, 1902, p. 71.

<sup>3</sup> Bericht d. Cokssyndicat, 1900, p. 4.

<sup>4</sup> *Id.*

<sup>5</sup> *Essen Hk.*, 1900, p. 5. "Zu ernsteren Befürchtungen hinsichtlich der weiterentwicklung der Dinge, bietet aber die Situation, nach unserer Ansicht, vorläufig wenigstens keine ausreichende Veranlassung."

not in individual excesses and misdoings, but in a general economic disorder, namely, overproduction.<sup>1</sup> This came to be the generally accepted view of the situation, and the hard times came to be regarded as a necessary process of purification (Reinigungsprozess) following a too rapid growth.<sup>2</sup> Whatever the proper theory of the situation, the facts were plain enough, and in 1901-1902 showed in most lines a discouragingly unreceptive domestic market for all forms of finished products. This was particularly true of the iron trade in rolled products and the finer manufactures and machinery, especially in electrical lines. The most encouraging feature appeared in 1902 in the great demand of the United States which the German producers hastened to take advantage of, though at prices that furnished little or no profit.<sup>3</sup> The domestic prices of rolled products showed very heavy declines as may be seen from the following table :

	1900 <sup>4</sup>	Mid year <sup>4</sup> 1901	July 15 <sup>5</sup> 1902
Bar Iron.....	215 m.	120.00 m.	125 m.
Girders.....	117 m.	110.00 m.	105 m.
Rods.....	185 m.	130.00 m.	135-140 m.
Boiler Plate.....	212 m.	180.00 m.	160 m.

The raw iron and Halbzeug cartells, on the other hand, owing to their long contracts and firm organization were much less affected, although they had to re-

<sup>1</sup> The Bochum chamber of commerce wrote in 1901; "das der deutsche Markt der vollständigen inneren Gesundheit entbehrte." *Bochum Hk.*, 1900, p. VII.

<sup>2</sup> "Der Rückschlag kennzeichnet sich vielmehr als ein durchaus nothwendiger und gesunder Reinigungsprozess, der auf jede länger andauernde Aufwärtsbewegung folgen muss." Steinmann-Bucher (?) in *Industrie Zeitung*, Jan. 3, 1902, p. 2.

<sup>3</sup> *Berlin Hk.*, 1902, p. 32.

<sup>4</sup> *Düsseldorf Hk.*, 1901, I, p. 17.

<sup>5</sup> *Glückauf*, Aug. 2, 1902.



duce prices sooner or later also. For the export business, they had to meet the world market price.<sup>1</sup> The average contract prices of the Düsseldorf syndicate showed, in fact, an advance in 1901 for raw iron<sup>2</sup>:

	<i>Puddel</i>	<i>Thomas</i>
1900.....	63.33 m.	65.49 m.
1901.....	83.14 m.	84.65 m.
1902.....	58.38 m.	52.62 m.

For Halbzeug the agreed syndicate prices were:<sup>3</sup>

	<i>Feb. 1900</i>	<i>Mar. 1901</i>	<i>Oct. 1902.</i>
Thomas, Rohblöcke.....	125 m.	85 m.	77.50 m.
Thomas, Knüppel.....	135 m.	97 m.	90 m.

Strongest of all was the position of the coal and coke syndicates.

The coal industry was not seriously injured by the crisis, and the dividends in 1901 and 1902 showed only a slight falling off, as compared with 1900, and were higher than in 1899. The chief difficulty with the coal producers was not in prices, over which they had a pretty effective control, but with the disposal of their output under conditions of decreasing demand and rapidly increasing capacity. The weakness of the market in 1901 and 1902 led to a general reduction of output, not only in the Ruhr, but also in Upper Silesia. This was particularly marked for the coal syndicate which produced from 1900 to 1902 as follows<sup>4</sup>:

<i>Year</i>	<i>Output</i>	<i>Per cent. of Prussian Output</i>
1900.....	52,080,898 tons	51.08
1901.....	50,411,926 tons	49.81
1902.....	48,609,645 tons	48.55

<sup>1</sup> Cf. Wieser, pp. 319, 313; *Bochum Hk.*, 1901, p. 107.

<sup>2</sup> Voelcker, Bericht ueber das Kartellwesen in der inländischen Eisenindustrie, p. 128.

<sup>3</sup> Voelcker, Bericht, Eisenindustrie, p. 129.

<sup>4</sup> Bericht d. Kohlen Synd., 1902, p. 8.

As the estimated capacity of the syndicate had greatly increased in 1901 and 1902, the diminution of consumption made it necessary to place heavy limitations on the output of the mines. The contractions projected were, in fact, the highest ever proposed, 13.75 % in 1901 and 23.00 % in 1902. The actual contraction in each case was somewhat less, being 11.83 % and 19.59 % respectively.<sup>1</sup> Another means of meeting the difficulty of a decreased domestic consumption was to increase exports. In 1900 they had been 15.5 % of the total output, in 1901 they were 16.4 % and in 1902 they had increased to 19.0 %. Of course, these large exports were disposed of for what they could bring in the foreign markets, and generally below the domestic price.

The coal syndicate maintained its price scale of 1900 throughout 1901 in spite of considerable agitation against it on the part of the consumers.<sup>2</sup> In 1902 the price norms were reduced generally from .50 to 1.50 m. per ton. The market prices on the Börse in Essen were<sup>3</sup>

	<i>Gas</i>	<i>Gasflamm</i>	<i>Fett</i>	<i>Mager</i>
1901----	12.75 m-----	10.00 m-----	10.25 m-----	9.50 m-----
1902----	12.00 m-----	9.72 m-----	9.60 m-----	8.75 m-----

The *déroute* in the iron industry did not affect the coke syndicate very seriously, because it had sold most of its product for two years, and the iron producers who consumed the coke were in practically the same fortunate situation. The production of raw iron showed a decline, however, of 8.6 % in 1901, and, though it increased again in 1902, it did not reach the figures

<sup>1</sup> *Berichte d. Kohlen Syndicat*, 1901, 1902.

<sup>2</sup> They defended the policy by saying they must not injure those customers who had already bought their supply by giving lower prices to their competitors. See Kirdorf, *Cent. Verb. D. I.*, 1901, pp. 238-9. This was perhaps a good defense for 1900, but scarcely holds for 1901 contracts when the situation was plain.

<sup>3</sup> *Essen Hk.*, 1902, I, p. 71.

of 1900.<sup>1</sup> The coke syndicate, therefore, in performing its self-imposed function of accommodating the supply to the demand, was obliged to contract heavily the output of its ovens; viz., in 1901 to 6,833,567 tons, a contraction of 12.25%, and in 1902 to 6,873,162 tons, a contraction of 23.93%.<sup>2</sup> While the production of the coke syndicate had decreased in 1901-1902, as compared with 1900, both positively and relatively, the production of the Hüttenzechen showed a startling increase. In 1902 they produced 19.7% as against 12.2% in 1897.

The coke syndicate, in the matter of prices, was quite as stiff-necked as the coal syndicate. The two-year fusion price at 17.00 m. covered 1901. The current market quotations, as in 1900, rose much above that, and the average of the quotations noted on the Börse was 22.00 m. In 1902, the price norm of blast furnace coke was reduced to 15 m., which was also the price at Essen.<sup>3</sup>

The assistance given to the consumers of coal and coke by the two syndicates, in order to encourage the consumption of those commodities, became of peculiar importance to the iron industry after the crisis of 1900, since the high prices of fuel in the inland market had considerably increased the cost of production, while the opportunity for sale was very limited at home, and the producers of iron goods were forced to sell an unusually large proportion in foreign markets at prices that were usually far from remunerative. In 1901, it appears that the coal syndicate and the Halbzeugverband combined to pay an export bounty of 15 m. per ton to certain consumers, the amount of tonnage to be subventioned

<sup>1</sup> *Stahl u. Eisen*, 1902, p. 341.

<sup>2</sup> *Berichte d. Cokesyndicat*, 1901, 1902.

<sup>3</sup> *Essen Hk.*, 1902, I, p. 71.

being fixed at a maximum contingent of  $33\frac{1}{3}\%$  of the total output of the Halbzeugverband. The coal syndicate was to pay one-third of the bounty.<sup>1</sup>

The system of export bounties was continued in 1902 on a more elaborate plan. The coal and coke interests combined with the raw iron and Halbzeug, girder, wire and plate cartells to pay certain premiums to their consumers, successively, under the condition of exclusive purchase from the allied combinations. A central office was established in Düsseldorf called the "*Abrechnungsstelle für die Ausfuhr*" with two executive officers and a council of supervision. For the fourth quarter of 1902 the bounties are reported to have been as follows:<sup>2</sup>

1.50 m.	per ton coal.
2.50 " " "	raw iron (excl. coal bounty).
10.00 " " "	Halbzeug (incl. coal and iron bounty).

The coke syndicate refused to pay these bounties to iron exporters that did not use its coke.<sup>3</sup>

A very significant event occurred in the Ruhr in 1902, at least in its ultimate consequences, namely, the entrance of the fiscus into the district as a mine owner and producer, through the purchase of the mine Gladbeck besides extensive coal lands. For this purpose an appropriation of 58,000,000 marks was made.

We close this brief review of the operations of the syndicates with the year 1902, though at another point we shall have occasion to consider the reorganization of the syndicates which was brought about in the year following.

<sup>1</sup> *Düsseldorf Hk.*, 1901, p. 4.

<sup>2</sup> *Industrie Ztg.*, 14 Mar., 1902, p. 90; *Düsseldorf Hk.*, 1902, p. 34.

<sup>3</sup> *Industrie Ztg.*, 1902, p. 3.

## PART III

### INTERNAL ORGANIZATION AND POLICY

#### CHAPTER I

##### THE RHEINISH WESTPHALIAN COAL AND COKE SYNDICATES<sup>1</sup>

The organization of the coal cartell of the Ruhr for the period 1893-1903 was substantially as follows. The leading idea of this cartell is the abolition of price competition among its members.<sup>2</sup> For this purpose a selling company is established with the exclusive right to the sale of all coal put upon the market by the members of the cartell except in a few cases noted below.<sup>3</sup> This selling company is the syndicate—legally it is an independent society<sup>4</sup>—practically it is an agent of the cartell. Only through such a unitary system of sale is there any guarantee that the same sorts of coal will be sold for the same prices. The second object of the cartell is the regulation of production.<sup>5</sup> The machinery by which these ends are accomplished is briefly as follows:

The syndicate is organized in statutory form as a corporation (*Actiengesellschaft*) with designation of name, purpose, *i.e.*, purchase and sale of coal, coke and briquets,

<sup>1</sup> A considerable portion of this chapter was published in substantially the same form in *Mines and Minerals* for February and March, 1904, and is reproduced with permission.

<sup>2</sup> *Cent. Verband, D. I.*, 1901, p. 228, Kirdorf.

<sup>3</sup> Vertrag, § 1, ¶ 1-3. A mine cannot sell coal in the ground to third parties. Enquete, p. 36.

<sup>4</sup> Enquete, p. 34.

<sup>5</sup> *Cent. Verband, D. I.*, 1901, p. 228.

and domicile (Essen), (Statut, §§ 1, 2). It has the usual organs of an Actiengesellschaft, namely, executive committee (Vorstand), supervisory council (Aufsichtsrat), and general assembly (General-Versammlung) possessing the usual statutory powers (Statut, § 5). The capital is fixed at 900,000 marks and is divided in registered shares of three hundred marks each, transferable only with the consent of the Aufsichtsrat and the general assembly (Statut, § 3). These shares, as a matter of fact, are held by the mine owners exclusively.<sup>1</sup> The capital is purely nominal in amount and has no practical significance. The Vorstand consisting of two or more persons<sup>2</sup> is appointed by the Aufsichtsrat, and is therefore dependent on it (Statut, § 6). The functions of the Vorstand are extensive and include, (a) the purchase and sale of coal, coke and briquets produced by the syndicate mines or others (Statut, § 2, 5, Vertrag, § 1, ¶ 1, 4, 5, 6 and 7), (b) the determination of the actual selling price and the so-called accounting price (Vertrag, §§ 4, 5), (c) the proposal of the amount to be assessed on the mine owners to cover the costs and losses of the syndicate—“Umlage” (Vertrag, § 6), (d) the power to examine the books of the individual mines (Vertrag, § 7), (e) the calling of meetings of the mine owners (Vertrag, A. ¶ 6), and (f) the proposal of fines in case of breach of the agreement (Vertrag, § 8, ¶ 4). The Aufsichtsrat is composed of nine members, one third being elected each year by the general assembly (Statut, § 7), its functions are mainly supervisory; it appoints the Vorstand. The general assembly elects the Aufsichtsrat. Each share gives a right to one vote (Statut, § 10).

<sup>1</sup> No foreign capital is employed by the syndicate. *Cent. Verb., D. I.*, 1901, p. 227.

<sup>2</sup> At present four. *Steinkohlenzechen*, p. 86.

This syndicate (which as we have said is really composed of the mine owners), has a contract with the mine owners severally<sup>1</sup> by which it obligates itself to sell the whole output of the mines, (with some minor exceptions) under certain arrangements as to price and payment; the mine owners on the other hand obligate themselves to sell all their coal, coke, etc. to the syndicate, (Vertrag, § 1). Further, they agree with the syndicate and with each other to join together to form an organization of mine owners which shall make certain rules and confer authority on certain representatives, which rules and authorities the aforesaid mine owners obligate themselves to obey (Vertrag, intro.). This is the most vital part of the cartell. The principal features are as follows: all mine owners associate themselves into a loose body known as the assembly of mine-owners (Versammlung der Zechenbesitzer<sup>2</sup>) and establish two other organs of government known as the advisory council (Beirat) and the commission for fixing the participation figures (Kommission zur Feststellung der Beteiligungsziffern). The assembly of mine-owners meets as often as necessary, which is determined by the Beirat (generally monthly), or on demand of one-fifth of the votes. The summons come from the Vorstand of the syndicate. The votes are allotted on the scale of one vote to every 10,000 tons production. The chairman of the Beirat presides (Vertrag A.). The chief functions of the assembly of mine-owners are as follows: (a) election of Beirat, (b) election of commission on participation figures, (c) determination of amount of contraction of production, (d) determination of contribution and compensation (for

<sup>1</sup> In 1893 the number was ninety-nine, in 1901 it was eighty-five. *Cent. Verb., D. I.*, 1901, p. 227.

<sup>2</sup> This is a "Gesellschaft des bürgerlichen Rechts." *Enquete*, p. 34.

production above or below the allotted quantity), (e), admission of new members and (f) determination of share holding in the syndicate (Vertrag A.). The Beirat is constituted on the basis of one member for every million tons of production; groups of mine-owners may join to elect a member. It is chosen annually (Vertrag B.). The powers and functions of the Beirat are as follows: (a) it chooses its presiding officers (Vertrag B.), (b) it fixes the general price norms (Richtpreise) (Vertrag, § 5), (c) it decides how high the assessment (Umlage) shall be (Vertrag, § 6), (d) it adjudges penalties on demand of the Vorstand (Vertrag, § 8, ¶ 4), (e) it determines to a certain extent what persons shall serve on the commission for fixing the participation figures, (Vertrag C., ¶ 4), and, (f) it is a court of appeal on the determination of the participation figures (Vertrag, § 2, ¶ 5), prices paid to the mines (Vertrag, § 5, ¶ 3), and of quality of coal furnished by the mines (Vertrag, § 5, ¶ 5). The commission for fixing the participation figures is composed of four members, including two technical experts, a merchant and a member of the Vorstand. Twice the required number in each case are named by the assembly of mine-owners. The Beirat decides which shall act in each particular case with reference to procuring the most impartial settlement of the business, and may under certain conditions summon other persons to act. In case of a tie vote, the chairman of the Beirat decides (Vertrag C.). We come now to certain important specific rules in the agreement which guide the organs of the association in their actions.

*Participation in Production.* If a mine desires an increase in the allotment for production, a notice of six months must be given. An increase of production



should be granted according to the following provisions ; (1) if, in the view of the Vorstand, it involves no general reduction for the rest of the mines it may be allowed ; but, (2) if it does involve such a reduction, the commission for fixing the participation figures considers the proposed increase and acts according to the following rules, (a) in the case of a new shaft there must be proof of the technical capacity of production ; (b) in other cases not only technical capacity but also the situation of the coal market may be taken into account in judging whether the claim ought to be allowed (Vertrag, § 2, ¶ 2, 3, 4). Every mine owner has the right and duty to participate in production according to the amount of his participation figure. If a contraction in the total output is made, it must be by a proportional reduction for all mines. In reckoning participation and contraction, all shafts belonging to a single company are taken together as a unit. Selling combinations (Verkaufsvereine) of several mines are allowed the same privilege (Vertrag, § 2, ¶ 7-10). In case the occupation of the mines is not in due proportion, those that exceed their allowed quantum must pay a contribution, and those that fall short of the same are entitled to a compensation. The contribution and compensation are fixed per ton and must equal each other, (Vertrag, § 2, 11, 13). Reductions of participation may be obtained by claiming them with four weeks notice. The Vorstand may be empowered by the assembly of mine-owners to permit a mine to reduce its participation outside of the regular order (Vertrag, § 2, ¶ 7, 14).

The obligation of the mine-owners to sell all their coal, coke, etc. to the syndicate is subject to certain exceptions, as follows: (a) use in the mining works

themselves (Selbstverbrauch), (b) local supply, excluding the regular supply of works (Landdebit), (c) the supply of mine officials and mine laborers and charitable dispositions (Deputatkohlen, etc.). These dispositions come however under the control and oversight of the syndicate; where the coal is sold to the neighborhood and to mine employees (Landdebit and Deputatkohlen). it comes also under its price control; they are all included in the calculation of the participation figures<sup>1</sup> (Vertrag, § 1, ¶ 2, 3).

*Determination of Prices.* The Beirat fixes the normal prices of coal of average quality<sup>2</sup> (Richtpreise), which are used as a guide by the Vorstand in fixing the so-called accounting-prices (Verrechnungspreise), the latter being the prices at which the syndicate takes the coal from the mine-owners (Vertrag, § 4, § 5, ¶ 1, 2). They vary somewhat according to quality, some being over and some below the normal prices.<sup>3</sup> The Verrechnungspreise are also substantially those at which the syndicate sells the coal in general, that is, in the non-competitive regions. In the competitive regions, the syndicate takes what it can get, it may ask more, but it is generally compelled to take less. But in all cases, the mine-owners get at least the Verrechnungspreise (Vertrag, § 5). Any excess of the actual selling price over the Verrechnungspreis, if obtained in the non-competitive regions, goes to the mine supplying

<sup>1</sup> The syndicate coal mines owned by blast furnaces give notice each year how much they will retain for their own use, and the price for the same is arranged with the syndicate. *Stahl u. Eisen*, 1900, p. 671.

<sup>2</sup> Enquete, p. 60.

<sup>3</sup> Id., p. 69. Essential variations of the selling price from the normal price, are to be explained, apart from error, by the necessity of reducing the prices in order to make a sale—a fundamental obligation of the syndicate. Cf. *Cent. Verb. D. I.*, 1901, p. 233.

the coal, in other cases it belongs to the syndicate (Vertrag, § 5, ¶ 4.)

Since the total sales of the syndicate do not normally equal the total which it has to pay to the mine-owners together with other expenses, a general monthly assessment (Umlage) is made on all the mines to cover the deficit (Vertrag, § 6). The terms of the contracts of sale to the consumers are made by the Vorstand (Vertrag, § 4); the mines are responsible for the supply of the coal, *i. e.* of the proper weight, quality, etc. (Vertrag, § 5, ¶ 5); the syndicate has the financial responsibility of the sale (Vertrag, § 1, ¶ 1). The accounts between the syndicate and the mine-owners (including the Umlage) are settled monthly (Vertrag, § 5, ¶ 4, § 6).

*Penalties.* For every evasion of the selling agreement by a mine-owner, a fine of fifty marks per ton is established (Vertrag, § 8, ¶ 1); for failure to furnish the supply due, penalties are to be fixed by the assembly of mine-owners (Vertrag, § 8, ¶ 2); for all other breaches of the contract; the fine is one thousand marks but this may be reduced by the assembly of mine owners to one hundred marks (Vertrag, § 8, ¶ 3, 5). The levy of fines does not prejudice any claim for damages the syndicate may have (Vertrag, § 8, ¶ 9).

A peculiarity of the syndicate is that it has not generally speaking profits or losses; all its expenses are covered by assessments on the mine-owners.<sup>1</sup> Its capital is a merely nominal sum—900,000 marks. The syndicate has apparently invested a part of it in the “Westfälische Transport A. G.”<sup>2</sup> The report of the syndicate for 1902 expresses the hope for a moderate profit from this company for the ensuing year.<sup>3</sup>

<sup>1</sup> *Cent. Verb. D. I.*, 1901 p. 227, Kirdorf.

<sup>2</sup> *Enquete*, p. 29.

<sup>3</sup> *Ber. d. Rh. Westf. Kohl. Synd.*, 1902, p. 10.

*The Westphalian Coke Syndicate.* The organization of the coke syndicate is very similar to the coal syndicate and, indeed, was indirectly the model on which the latter was formed. The "Statut" of the coke syndicate specifies the name (Actien-gesellschaft Westfälisches Cokssyndicat), site (Bochum) and business ("purchase and sale of coke and coal") of the undertaking (§§ 1, 2). The capital is fixed at 400,000 marks, divided into two thousand registered shares (§ 3). The organs are: (a) Vorstand, (b) Aufsichtsrat and (c) general assembly (§ 4). The Vorstand is composed of two members who are elected by the general assembly on nomination by the Aufsichtsrat (§ 5). The Aufsichtsrat is composed of fifteen members elected by the general assembly (§ 8). The general assembly requires a majority vote for its determinations in general, but in certain cases (*e. g.*, merger or dissolution) a three-fourths vote is necessary (§ 14).

The treaty of the cokeworks-owners with the syndicate and each other is entitled "the regulation for business and purveyance" (Geschäfts- und Lieferungs-Ordnung). The general organization and the terms of the contract are similar to those of the coal syndicate, except there is no Beirat. The Aufsichtsrat of the coke syndicate performs in general the functions of the Beirat of the coal syndicate. The reason for this probably is purely practical, *i. e.*; the small number of members (44)<sup>1</sup> make any such intermediate organization between the general assembly and the Aufsichtsrat unnecessary. The chief powers of the Aufsichtsrat are: (a) determination of the accounting price (Vertrag, § 4), (b) assessment of fines (Ordnung, § 2, 9), (c) proposal of

<sup>1</sup> Not Kokskohle as stated by the Referent in the Enquete, p. 614.

<sup>2</sup> Enquete, p. 791.

Umlage (Ordnung, § 6), (d) selection of commission on participation (Ordnung B), (e) final determination of proper fulfillment of contracts, (Ordnung, § 5), (f) nomination of Vorstand (Statut, § 5) The general assembly of cokeworks-owners is composed of official representatives of each concern who have one vote for each 1,000 tons of participation (Ordnung, A). The most important powers are: (a) determining the contraction (Ordnung, § 2), (b) determining the Umlage (Ordnung, § 6), (c), appeal on questions of participation and fines (Ordnung, § § 2, 9), (d) election of commission on participation (Ordnung, A).

The commission for fixing the participation figures is composed of four members, including two technical experts, a merchant and a member of the Vorstand. Double the number are chosen in each case, and the members are selected by the Aufsichtsrat with regard to procuring the most impartial judgment in each instance, and, if necessary, other persons may be substituted (Ordnung, B).

The cokeworks-owners agree to sell through the syndicate all their coke which is put up for sale, except Landdebit, in so far as neighboring works are not regularly supplied. The consumption of coke in the coke works is not included in the participation figure (Ordnung, § 1).

The regulations for the participation figures are established as follows. In the case of a new member, the commission for fixing the participation figure determines the technical capacity simply, which gives the participation to be allowed. In the case of a demand for an increase of participation by a member, the commission must consider not only the technical possibility but also the situation of the market. Appeal from the

decisions of the commission may be taken by the Vorstand or the party claiming the grant of participation to the general assembly of cokeworks-owners (Ordnung, § 2). In case the situation of the market makes a contraction of production necessary, the same must be made proportionally to the participation (Ordnung, § 2). Cokeworks united under the control of a single concern or a "selling union" are regarded for this purpose as a unit (Ordnung, § 2).

The coke syndicate purchases the coke from the cokeworks-owners according to the terms of § 4 of the treaty with the coal syndicate (see below). The prices at which the coke shall be sold are also regulated by § 4 of that treaty (Ordnung, § 3). The cokeworks-owners are responsible for the fulfilment of the orders given to them, in respect to quantity<sup>1</sup> and quality, and must pay any costs arising from any deficiency therein. The Vorstand decides in the first instance if such an obligation has been incurred; appeal may be made to the Aufsichtsrat (Ordnung, § 5).

Penalties are provided as follows: For failure to furnish the quantities assigned, a fine is imposed of two marks per ton short (Ordnung, § 2). For direct sale contrary to the provisions of the agreement, a fine of fifty marks per ton is imposed (Ordnung, § 7). For other violations of the agreement, a fine of one thousand marks is imposed (Ordnung, § 8). The Aufsichtsrat adjudges the fines, but appeal lies to the assembly of cokeworks-owners (Ordnung, § 2, 9). Further the assembly of cokeworks-owners under unusual conditions may reduce a fine from one thousand to one hundred marks (Ordnung, § 9).

<sup>1</sup> In 1899 the syndicate threatened to reduce the participation of members if they did not fulfill the orders given them. *Indust. Ztg.*, 1899, p. 409.

In order to defray the expenses of the coke syndicate a proportional assessment (*Umlage*) is to be levied monthly at an amount to be fixed by the assembly of cokeworks-owners (Ordnung, § 6). The Vorstand of the coke syndicate has the right to examine all books and papers of the syndicate members (Ordnung, § 10).

The treaty between the coal syndicate and the coke syndicate was established March 11, 1895, by which the sale of the coke was transferred to the coal syndicate for the benefit of the coke syndicate for three years. This was afterwards (Dec. 11, 1897) extended for five years to Dec. 31, 1902, and later for another year.<sup>1</sup> The principal provisions of the treaty are as follows. The relations of the coke syndicate to the cokeworks-owners are left undisturbed (Vertrag, § 1, 6). The participation figures of the cokeworks are to be determined anew on the basis of their actual capacity (Vertrag, § 2). A contraction of coke production shall be determined by the coke producers, but it must have also the assent of the Vorstand of the coal syndicate, or failing that, the assent of the Beirat of the coal syndicate (Vertrag, § 3).

The normal prices (Verrechnungspreise) of coke are to be fixed by the Aufsichtsrat of the coke syndicate on the proposition of the Vorstand of the same.<sup>2</sup> These are the prices to be credited to the coke works. The Vorstand may not sell below these prices, except, abroad in cases of pressing necessity, and, in the domestic market only with the consent of the Aufsichtsrat; such loss as is thereby incurred must be borne by the coke syndicate, but any gain obtained by higher prices is to be credited to the coke works supplying the coke (Vertrag, § 4).

<sup>1</sup> *Industrie Ztg.*, 1902, p. 482.

<sup>2</sup> There are no "Richtpreise" in the coke syndicate, or rather the Verrechnungspreise stand in place of them.

The expenses and losses of the coke syndicate are to be covered by an assessment (Umlage) levied on the coke-works-owners : (Vertrag, § 5).

The coal syndicate agrees not to supply coking-coal to private coke works but to transfer all dealings with the private coke works to the coke syndicate (Vertrag, § 7). According to a subsequent agreement, (Jan. 18, 1897), the coke syndicate agreed to elect two members of the Vorstand of the coal syndicate to the Aufsichtsrat of the coke syndicate, and agreed further not to purchase any coal from non-syndicate mines. The Vorstand of the coal syndicate acts as an agent in the sale of coke or as an organ of the coke syndicate ; it has also the right to check all its shipments.<sup>1</sup>

We should notice here the treaty between the Ruhr coke syndicate and the Belgian coke syndicate. This was made in 1894 and provided for a division of the field. The terms are given by de Leener as follows. There are two *rayons*. *Rayon A* comprises the Longwy district, the region about Nancy, Alsace-Lorraine, Luxemburg and Germany ; in these regions the share of the Belgian syndicate is 19.18 % and the share of the Ruhr syndicate 80.82 %. *Rayon B* comprises Belgium, Haute Marne and northern France ; the share of the Belgian syndicate is 63.5 %, the share of the Ruhr syndicate 36.5 %. Provision was made for certain payments in case one party or the other exceeded the agreed quota, but practically they have succeeded in regulating the sale conformably to the provision of the *rayons*.<sup>2</sup>

The coal syndicate is united with the Briketverkaufsverein under a treaty similar to that which it has made with the coke syndicate.<sup>3</sup> There is no cartell agreement,

<sup>1</sup> Enquete, p. 616. .

<sup>2</sup> de Leener, pp. 230-1.

<sup>3</sup> Denkschrift, p. 5.



however, between the coal or coke syndicates and the "Teer" and "Ammoniak" and "Benzol" cartells,<sup>1</sup> though they are nearly identical with the coke syndicate. The relations with the iron cartells seem to be limited to numerous close personal interests,<sup>2</sup> on the one hand, and to the export bounty associations on the other.

The cartell agreement, under which the coal activity of the coal syndicate has developed so far, was to terminate at the end of December, 1905; provided, that, if no member made a written objection one year before its expiry, it should be continued for ten years. That it will be continued according to that provision seems more than doubtful, when the sharp differences and conflicts of interest between the mines are taken into consideration. The original treaty was a work of compromises, and as the chairman Herr Kirdorf says<sup>3</sup> was not regarded by the parties themselves as a perfect instrument. Some of the defects arose from the unavoidable conditions of the situation, some lay in the plan of organization. The two chief defects of the former kind were the lack of identity of interests of different groups of mines, owing to different conditions of production, and the lack of identity of interests between the companies solely engaged in the production of coal and coke, and those also engaged in the manufacture of iron, in transportation, etc.

The parties among the coal mining concerns may be grouped, first, according to the kind of coal mined, and second, according to the size of the mines. In the first group there were two parties and three sorts of coal, namely, the producers of Fett and Gas coal on the one

<sup>1</sup> Enquete, p. 625.

<sup>2</sup> *Id.* p. 68.

<sup>3</sup> *Cent. Verb. D. I.*, 1901, p. 226.

side and Mager coal on the other side ; that is, the bituminous against the hard coal. The former party produces the chief sorts of industrial coal, including coking coal, gas coal, steam coal, etc. The latter produces chiefly a house fuel (especially for winter consumption), though its product is also largely used for lime and and brick burning and briquet manufacture. The quantitative importance in 1902 was as follows :<sup>1</sup>

	<i>Output</i>	<i>Per cent of total</i>
Fett .....	28,859,000 tons .....	59.37
Gas and Gas flame .....	13,912,000 tons .....	28.62
Mager and Ess .....	5,837,000 tons .....	12.01

The trouble lay with the minority producers of Mager and Ess coal.<sup>2</sup> They have a high cost of production, and, unless prices are made pretty high for other sorts of coal, they are not able to obtain a price for their less favored product which will give them adequate profits.<sup>3</sup> If the prices of Mager coal were advanced without raising the prices of the other sorts, they simply would not find any sale. Hence they belong to the radical wing of the high price party in the councils of the syndicate. There are other difficulties with the Mager coal group, but they belong rather to the avoidable kind and will be considered below. As the Mager coal producers are in a small minority, they would not have much influence on prices if it were not for the fact that there is another group that has a similar interest ; this is the group of small mines.<sup>4</sup> According to the participation figures for the first of January, 1903, there were twenty concerns with between 100,000 and 200,000 tons, twenty-six concerns between 200,000 and 500,000 tons, twenty-two concerns

<sup>1</sup> Ber. d. Rh. Westf. Kohlensyndicat, 1902, p. 7.

<sup>2</sup> Cf. Enquete, p. 45.

<sup>3</sup> Enquete, p. 58.

<sup>4</sup> Cf. Enquete, pp. 46, 58.

between 500,000 and 1,000,000 tons, twelve concerns between 1 million and 2 million tons, two concerns between 2 million and 5 million tons and two concerns over 6 million tons.<sup>1</sup> The voting, as we have seen, was in proportion to tonnage, and for the Beirat, a member was eligible for every million tons owned by a mine or group of mines. Just how the votes were combined is a matter not made public, but the small mines had at least a considerable influence. The small mines represent on the whole a lower grade of productivity than the large ones. Other differences existed between them which we may consider at another point.

The advantages of the syndicate to the different mines is difficult to determine. The following from the *Frankfurter Zeitung* throws some light on the problem. "Whether the coal syndicate is more advantageous to the large or to the weaker mines has been a subject of differences of opinion from the beginning and is so still. The relations naturally are not everywhere the same, so that in individual cases the combination can give very different results. In general, it is well established that the organization of the syndicate has been of great value for the less capable mines, inasmuch as these by means of the combination are dragged along by the productive mines in good and bad times. On the other hand, the small mines complain that the existence of the syndicate is used by the large concerns to their disadvantage, because these with their preponderance in coal fields, in capital and in credit, can proceed much easier in the laying out of new shafts and thereby increase their participation correspondingly. But under the present (1903) relations, the large concerns with several shafts

<sup>1</sup> Enquete, p. 281. The average is about 740,000 tons.

are compelled to contract their output to the advantage of the weaker mines, since under free competition, they would be able to use their productive power considerably more, just as the outsiders are able to do. This view is often openly expressed in the circles of the leaders of the large mines, and it is thereby emphasized that they really set little store on the prolongation of the syndicate, because they are not only equal to the situation without its continuance, but also would obtain a greater profit without it. Further, the continued refusal of the large non-syndicate mines to enter the syndicate appears to support the assertion that it is just with the large undertakings, that the syndicate is not able to make good in the manner that they desire."<sup>1</sup>

The smelter mines (*Hüttenzechen*) form another group whose interests are not, from the nature of the case, entirely the same as the other mines; but the principal difficulties are avoidable by special provisions in the agreement. It seems to have been to their advantage to support the coke interests in keeping up high prices for coking-coal and coke. A rather peculiar element of the situation was that there were certain coal mines owned by Rhine transportation companies whose predominant interest was to have low coal prices in order that coal shipments might be as extensive as possible.<sup>2</sup>

The chief difficulties that arose in the operation of the cartell, owing to the form of the treaty, were concerning the participation figures, the Umlage, bounties, the smelter consumption, the too loose relations of the coal and coke cartells and the lack of general powers of the

<sup>1</sup> *Frankfurter Zig.*, 5 Jan., 1903; quoted in *Kartell Rundschau*, II, p. 102.

<sup>2</sup> Sarter, pp. 30-1.

coal syndicate. The really fatal weakness was the method of granting increases in the participation figures. The treaty provided that the increase of participation could be demanded as of right in the case of new shafts when they proved a technical capacity of production ; for the existing mines, no increase of participation could be obtained, practically, unless the situation of the market made it possible to sell the already existing allotments.<sup>1</sup> This provision worked badly for the whole syndicate and with especial injury to the smaller companies.<sup>2</sup> For the syndicate in general, it was a great disadvantage, because it provoked a race among the companies to increase their participation figures. The increase in participation figures grew more rapidly than the possibilities of sale, except for one or two years of the boom, and when the crisis came an enormous contraction of production was required. The advantage to the individual mine obtaining an increase lay in the fact that the increase in participation was greater than the subsequent contraction. To get this the mine had to undertake the very expensive development of new shafts, which meant a relative increase of capital per ton output. This was a paying policy as long as the price of coal was high. The advantage of the policy would be very great, however, only as long as the number of mines which pursued it was relatively small. If it became general, it would result in a loss. As a matter of fact, the practice was carried so far in recent years that it threatened to become a losing game, but nevertheless, a game which no mine would give up unless the

<sup>1</sup> On the other hand there are mines with a participation in excess of their capacity. When a contraction is made, they are given an undue advantage, *Cent. Verb., D. I.*, 1901, p. 231.

<sup>2</sup> *Kölnische Ztg.*, May 15, 1903.

others did. This evidently required a better governing power in the syndicate. For the small mines which did not have the coal fields and capital required for the operation the practice was wholly injurious. For the consumer, too, it was injurious, because the increase of capacity did not mean any increase in production or reduction in prices; on the contrary, it furnished another motive for keeping prices high. In the coke syndicate, this difficulty was avoided simply by providing that there should be no increase in participation unless the situation of the market made it practicable.

Another very important difficulty was concerning the Umlage. The Umlage is assessed partly for the payment of the general administrative expenses of the syndicate, but mostly for the promotion of the export trade and the sale of coal in other competitive regions where the price paid to the syndicate is less than the price the syndicate has to pay to the mine supplying the coal. The coal so shipped is for the most part of the finer qualities, since it must be able to bear the cost of transportation. These kinds of coal are not produced much by the Mager coal mines nor by the small mines either to any great extent, because it requires a good deal of capital to erect the plant for refining the coal. Hence these mines have little or no benefit therefrom and, nevertheless, have to pay the tax. The same is true to a considerable extent of the Hüttenzechen, which use most of their own production. The Mager coal mines require a greater percentage of their coal to operate their works and so find the tax disproportionately heavy. The Umlage works unequally in other ways. In some years, a considerable portion of it has been levied for the purpose of paying export bounties to the iron manufacturers, on the ground that the

consumption of coal was maintained thereby. But not all the mines produce a fuel adapted to use in the manufacture of iron. Here again, the Mager coal interests were at a disadvantage. The smelters, etc., which owned coal mines at the time of the formation of the syndicate did not come in naturally, because they had very little coal to sell.

The advantages of owning an independent supply of raw material became more and more apparent to the iron producers, especially as the prices of coal steadily advanced. Some of the syndicate mines were bought up by iron concerns with the object of acquiring control over supply. Such transfers did not free them, practically from the control of the syndicate. At least the vendors would remain liable, so that if the purchasers did not conform to the obligations of their predecessors, the syndicate could bring an action for damages against the vendors.<sup>1</sup> Iron works owning such mines had to buy their coal, therefore, at syndicate prices. They claimed, indeed, that they were exempt on that coal produced which they used in their own iron works, according to the provision of the treaty which excludes "Selbstverbrauch" (*i. e.*, coal used in operating the works) from the price control of the syndicate. This claim, however, was not allowed by the courts.<sup>2</sup> Such mine-owners would, obviously, never consent to the continuation of the treaty with such a provision beyond the period of legal obligation. They also found it unfair that they should pay the Umlage on the same basis as the other mines, because they had little interest in export (especially at prices that would aid their rivals), and in so far as the

<sup>1</sup> Enquete, pp. 35-6.

<sup>2</sup> *Industrie Ztg.*, 1899, p. 557.

Umlage was expended for bounties, the advantage they obtained from such payments were perhaps more than offset by the encouragement it gave their competitors.

Finally we may notice that the cartell had certain general defects which prevented a harmonious or efficient operation. One, undoubtedly, was the loose relation existing between the coal and coke syndicates. The two commodities were produced by the same interests to a large extent, the coke being a product of the Fett coal group. The producers of coking-coal tended to get a still greater influence in the price policy of the syndicate through their influence on the price of coking-coal.

Another defect of the syndicate may be said to be rather a defect of the cartell system, namely, a lack of general powers. Cartell government, even in its more elaborate forms, is like that of a political confederacy. The central power is too feeble; the stipulations introduced for the protection of the members tend to make the cartell weak in its relations with outsiders. It limits the competitive power of the combination. This seems to be true, for example, in the relations of the syndicates to the local outsiders. They have grown faster than the syndicates (especially the coke producers), expanding their production, taking lower prices than the syndicate when the market is weak, and exacting higher prices than the syndicate when the market is strong. As the syndicate leaders confess they "got their fill" first,<sup>1</sup> and they have the best of it in prices. But without the syndicate, they would be no better off than other producers. They stay out for their own advantage as

<sup>1</sup> Enquete, p. 78.



against the advantage of their industry. With greater war powers, the syndicate might perhaps bring them to terms, though it would be very difficult. In some ways, the syndicate would be stronger, if it could expel some of its members, *i. e.* the poor mines, especially the Mager coal producers. If they were outside, they might be driven out of the business entirely by a price war, and the richer mines could monopolize the field afterwards. Herr Kirdorf, the head of the coal syndicate, said in the recent government investigation that he would have preferred to have had them stay outside.<sup>1</sup> He frankly acknowledged that he thought the cartell would be more effective if it had an autocratic instead of a parliamentary system, *i. e.* if the Vorstand controlled the whole business; at the same time, however, he declared that it was impossible to make any extensive changes in the organization as things stood.<sup>2</sup>

Such, in general, were the weaknesses of the syndicate. Its control of the situation was rendered more precarious in recent years through three circumstances, (1) the enormous increase of the claims for participation, (2) the danger of losing more mines through purchase by the blast-furnaces and other consumers, and (3) the development of new coal fields in the north. The amount of participation on Jan. 1, 1902 was 58,973,003 tons<sup>3</sup>; it had increased by Jan. 1, 1903 to 62,199,437 tons.<sup>4</sup> It was reported to have advanced on July 1, 1903, to 64,090,000 tons, with 1,533,000 tons in claims awaiting adjustment on October 1, 1903.<sup>5</sup> Besides

<sup>1</sup> Enquete, p. 58.

<sup>2</sup> Id, p. 57.

<sup>3</sup> Bericht d. Kohlen Syndicat, 1902, p. 6.

<sup>4</sup> Enquete, p. 281.

<sup>5</sup> *Kölnische Ztg.*, July 24, 1903.

this, there were claims pending on account of old shafts of 6,800,000 tons<sup>1</sup> which could not be allowed until the market situation made it possible to remove limitations on production. The actual output in 1902, however, had been restricted to 48,609,645 tons.<sup>2</sup> As the *Kölnische Zeitung* declared, "Particularly must the nonsensical chase of the individual mines after higher participation figures be put a stop to once for all."<sup>3</sup> Between March, 1899, and May, 1900, eight syndicate mines passed into the hands of blast-furnaces.<sup>4</sup> The crisis brought a stop to this movement temporarily, but it was beyond question that after the termination of the existing obligations of the compact, which expired at the end of 1905, others would be absorbed, unless measures were taken to prevent it. Of greater importance even than this was the development and purchase of new mines in the north, especially, by iron producers.<sup>5</sup> Deep shafts are required here and are made possible by the modern improvements in technique. These northern coal fields have been developed largely through the enterprise of boring companies.<sup>6</sup> In order to protect itself against future competition, it was evidently necessary for the syndicate (1) to make the conditions sufficiently favorable to the "Hüttenzechen" to induce them to stay in the cartell, (2) to bring in the principal outside

<sup>1</sup> *Kölnische Ztg.*, May 15, 1903.

<sup>2</sup> Bericht d. Kohlen Syndicat, 1902, p. 8.

<sup>3</sup> *Kölnische Ztg.*, June 26, 1903.

<sup>4</sup> Enquete, pp. 275-8.

<sup>5</sup> E. g. Minister Achenbach by Gebr. Stumm, de Wendel by de Wendel, Maximilian by Maximilianhütte, Emscher-Lippe by Krupp and the Norddeutscher Lloyd. Cf., *Berliner Tageblatt*, July 27, 1903, Liefmann, Schutzzoll, p. 70.

<sup>6</sup> Especially the International Bohrgesellschaft, Norddeutscher Tiefbohr A. G., the Westfalen and the Anna Liese. *Tageblatt*, July 27, 1903; *Dortmunder Ztg.*, July 9, 1903, etc.

competitors and (3) to get a dominant influence in the new territory in the north.<sup>1</sup>

The plans for a new cartell compact were under way in 1902, but their contents were not generally known until May, 1903. From that time until the end of the year, a very lively propaganda was carried on in the circle of coal interests to bring about its acceptance, and the disastrous effects on the mining industry and on German industry in general, if it failed of acceptance, were painted in the darkest colors. There was a very powerful opposition from certain large mines within the syndicate itself on account of the clause which provided that no claims for participation, not allowed by September 30, 1903, should be granted, except under the terms of the new compact, (which was to go into effect the following day, if accepted) which practically meant a long postponement.<sup>2</sup> Even more serious difficulty existed in inducing the entry of outsiders. There were about thirty-seven outsiders in the district in 1902 which produced coal. Of these thirteen were owned by blast-furnaces, etc. and produced about 6,679,000 tons; the remaining twenty-four produced about 3,225,000 tons.<sup>3</sup> Five of the outside mines with a production of 2,055,499 tons belonged to two companies (Krupp and Bochumer Verein) which had mines in the syndicate and sold their extra production through the syndicate. The chief problem, therefore, was to persuade those to join who had no connection with the syndicate. The most important Hüttenzechen were Deutscher Kaiser (1,576,593 tons), owned by the Thyssens, great iron manufact-

<sup>1</sup> *Industrie Zig.*, 1902, p. 182.

<sup>2</sup> *Frankfurter Zig.*, Sept. 13, 1903; *Kartell Rundschau*, 1903, pp. 858-9.

<sup>3</sup> Steinkohlenzechen.

urers; next the mines of the Gutehoffnungshütte (1,389,953 tons), Dortmunder Union (570,353 tons), Phönix (459,468 tons), Hörder (427,391 tons), which together with the others had a total output in 1902 of 4,623,973 tons. The remaining twenty-four outsiders produced 3,224,646 tons and of these only seven over 100,000 tons apiece. By far the most important were the two mines of the shipping firm of Haniel, Neumühl and Rheinpreussen, which produced 1,070,792 tons and 800,000 tons (approx.) respectively. The chief problem evidently was to secure the adhesion of Haniel and Thyssen and they made various difficulties with the apparent aim of exacting the largest possible participation.<sup>1</sup> A meeting on September 15, having failed to obtain a unanimous consent to the new compact, another meeting was called for September 30, at which it was accepted in spite of the refusal of one small mine (Freie Vogel u. Unverhofft) to sign. According to the terms of the old compact, it could not be terminated before the end of 1905, except by unanimous consent or notice of one year by four-fifths of the votes. The old compact was not legally terminated, therefore, with the beginning of the new one, as notice was not given by the required number of votes before September 30, 1903, and it is said that the syndicate will observe all its obligations to this one mine according to the terms of the old compact.<sup>2</sup> For the rest of the syndicate, the new compact took effect on October 1, 1903, and it was agreed that it should last in any case until the end of 1905, and, if accepted by all the outside mines with an output of more than 120,000 tons per annum (including Hüttenzechen), then it should stand until the end of 1915.<sup>3</sup> The task of

<sup>1</sup> *Kartell-Rundschau*, Aug. 28, 1903, p. 859.

<sup>2</sup> *Tageblatt*, Oct. 2, 1903.

<sup>3</sup> *Ib.*

bringing in all the outsiders was not an easy one. The difficulty was not so much any inveterate hostility to the syndicate idea or system, as the hope to make a good thing out of the situation, either (1) by obtaining exorbitant concessions in regard to rights of participation, or (2) by remaining outside and getting all the advantages accruing to the coal industry through the existence of combination without paying any of the costs. They all came in finally. Haniel received the enormous participation of 6,500,000 tons.<sup>1</sup> At a meeting held on December 29, 1903, the new compact was established to last until December 31, 1915.<sup>2</sup> All mines having a production of 120,000 tons or more, except Freie Vogel u. Unverhofft and the fiscal mine Gladbeck, are parties to the agreement. The effort to bring in the mines of the Aachen district failed. The participation, which on Oct. 1, 1903 amounted to 64,496,640 tons, was increased by the new accessions to 77,840,000 tons on Dec. 30, 1903, although by the terms of the new compact, a part of the production, namely, that used in supply of the mines, blast-furnaces, etc. connected therewith, is not included.<sup>3</sup>

Even before the new compact was ratified, the syndicate, according to report, had begun to negotiate for the acquisition of coal fields, while individual mines or groups of mines had also been active in the purchase of coal fields or of shares in the boring companies.<sup>4</sup> According to some views, these boring enterprises partake considerably of the nature of a "hold-up," but it is

<sup>1</sup> *Frankfurter Ztg.*, Dec., 17, 1903.

<sup>2</sup> *Tageblatt*, Dec. 30, 1903.

<sup>3</sup> *Frankfurter Ztg.*, Dec. 30, 1903.

<sup>4</sup> *Tageblatt*, July 17, 1903; *Kartell-Rundschau*, 1903, p. 817; *Kölnische Ztg.*, July 7, 1903.

asserted also that they have a solid value.<sup>1</sup> At any rate, the extent of the fields makes it a very difficult if not impossible task to prevent the re-establishment of serious local competition.<sup>2</sup>

The negotiations for the completion of a cartell of coal dealers on the Rhine was brought to a successful conclusion at about the same time. The cartell embraces all dealers taking over 50,000 tons per annum.<sup>3</sup> It is reported, also, that a deal has been put through with the shipowning mines which will exercise a pretty complete control of the shipping business on the Rhine.<sup>4</sup> This was used as a club, it is said, to compel Haniel to come in.

*The New Agreement.* The new compact or agreement provides for a radical amendment of the old one in several respects: in the definition of the functions of the cartell, in the regulation of participation, in the assessment of the Umlage, in the treatment of the consumption of the Hüttenzechen as to sale and Umlage, in the relation of the coke and briquet producers to the coal producers, and in the provision for competition. The text of the new agreement has not yet been published, but fairly complete and apparently trustworthy accounts of all important changes, apart from those of organization, are contained in a number of articles in the press and industrial journals.

In some respects the most extraordinary feature of the new cartell is the definition of functions, because this could not have been predicted from anything in the previous history of the organization. Instead of limiting the activity of the cartell to the "purchase

<sup>1</sup> *Tageblatt*, June 26, 1903; *Kölnische Ztg.*, July 7, 1903.

<sup>2</sup> *Tageblatt*, July 14, 1903.

<sup>3</sup> *Id.*, Dec. 24, 1903; Dec. 30, 1903.

<sup>4</sup> *Frankfurter Ztg.*, Oct. 7, 1903.

and sale of coal, coke and briquets," its objects and functions are enlarged, and defined as follows: "The object of the enterprise is the purchase and sale of coal, coke and briquets, the acquisition of mining lands and mining shares, the operation of enterprises of all kinds, which are concerned with the storage, the sale, and the promotion of mining products, as well as the participation in such enterprises."<sup>1</sup> The significance of this clause is very great. A cartell whose central government has large possessions, has already half accomplished the metamorphosis to a consolidation. It is understood among some of the leaders in the industry to be a step towards a so-called fusion or trust.<sup>2</sup> It appears that originally it was contemplated that the cartell should obtain the means to extend its activities in the manner described above through an increase in its capital stock,<sup>3</sup> but this was given up in favor of a method more in harmony with the existing system, namely, assessments on the members. It is provided, however, that if the amount expended for these or other purposes of the syndicate requires an assessment exceeding 3% of the total annual sales of the syndicate, consent to such extraordinary expenditure must be first obtained through a nine-tenths majority of the votes in the assembly of mine owners.<sup>4</sup> Among the immediate practical objects of this provision are supposed to be the acquisition by the syndicate of an extensive control over new coal fields and over the coal transportation interests on the Rhine.<sup>5</sup>

<sup>1</sup> *Kölnische Zeitung*, July 22, 1903.

<sup>2</sup> Commenting on the meaning of the new agreement the *Frankfurter Zeitung* says: "Schliesslich marchiren wir eben doch auf den Trust los." Sept. 16, 1903.

<sup>3</sup> *Kartell Rundschau*, 1903, pp. 741-2.

<sup>4</sup> *Kölnische Ztg.*, July 22, 1903; *Tageblatt*, July 7, 1903.

<sup>5</sup> *Id.*, *Ztg.*, July 7 and 22, 1903.

A second very important change in the agreement, and one which most affects its outward form, is contained in the articles which provide for the merging of the coke syndicate and the briket combination in the coal syndicate. All the particulars of these changes have not been divulged, but the chief facts seem to be substantially as follows. The former organization of the coal syndicate remains practically intact with Vorstand, Beirat and assembly of mine-owners, and in general, has the same functions as before, as well as a superior authority in general matters over the affiliated coke and briket works. On the other hand, the general organs of the coke and briket cartells disappear along with their independent legal existence. But, when a matter comes up for consideration which concerns the particular interests of the coke and briket producers, such as the allotment of participation figures or the election of the "coke commission" or "briket commission", only the representatives of the producers of those commodities, respectively, have voice or vote. The two "commissions" mentioned above become the special organs of control for their respective interests. Each of these commissions is composed of eight members, comprising six technical experts and two merchants. But, although the coke or briket producers decide in general on the quotas of production and the amount to be marketed, the amount to be produced must conform to the general scheme of production established for coal, and is also subject to reduction on the demand of the assembly of mine-owners.<sup>1</sup> Concerning this feature of the agreement the *Kölnische Zeitung* says: "In this affiliation, which has been frequently suggested before in other forms, there exist

<sup>1</sup> *Kölnische Ztg.*, June 19, 1903.



doubtless great advantages. The oversight of the whole coal and coke market is materially facilitated, the development of the market situation may be judged more correctly, and shipment can be systematically, and therefore, more cheaply regulated."<sup>1</sup>

The rules regarding participation are modified in important particulars although the general scheme remains the same. The coal mines start with the allotted participation figures possessed before October 1, 1903, under the preceding agreement. For the Hüttenzechen, on the other hand, as well as for new members not connected with smelters, special agreements in respect to initial quotas are provided. Voluntary reduction may be made in the participation figures, but not for merely temporary purposes. The most important provision, of course, is that respecting an increase in participation. The rule is that when the situation of the market permits an increase of sales, the total available increase in production so occurring shall be allotted proportionally among the several members. Such grants of participation are not acquired as a permanent right, unless the mines obtaining the same actually supply the quantity allotted for six months following. Hence the only condition under which a mine can get an increase of participation are, (1) a general increase of participation in consequence of an increased demand, or (2) the purchase of mines which have rights of participation in the syndicate.<sup>2</sup> For coke the rule remains

<sup>1</sup> *Supra*, June 19, 1903.

<sup>2</sup> *Id.*, July 22, 1903. This journal prophetically remarks (see p. 109): "Nach Inkrafttreten des neuen Vertrags alle minderwertigen Zechen einfach wegen ihrer Beteiligungsziffern ein willkommenes Kaufobjekt für die kapitalkräftigen Zechen selbst dann sind, wenn derartige minderwertige Zechen künftighin stillgelegt werden."

substantially as before; no increase of participation unless there is technical possibility of production, and the exercise of the right would not involve a reduction in the output of other works, and, further, this must be in agreement with the general scheme for coal production.<sup>1</sup> In case a syndicate mine establishes a coke plant, the initial participation allowed is restricted to 100,000 tons; similarly for a new briket plant, the limit is 72,000 tons.<sup>2</sup>

A vital feature of the scheme of participation, as established in the new agreement, is concerning the exclusion of coal consumed at the mines and works (*Selbstverbrauch*) from the reckoning of participation. The significance of this matter has been sufficiently discussed above; the new rule is substantially as follows. Excluded from the reckoning of participation, and also from the assessment of the Umlage, are the coal, coke and brikets used in the mines, in smelters in possession of the mining company at the time of the formation of the agreement, in cokeries, tar distilleries, gas generators and other gas works, briket works and brick works, in so far as these are operated in immediate connection with the mines by the owners thereof.<sup>3</sup> Two points should be emphasized here, (1) new acquisitions of mines by blast furnaces, will not have this privilege, and, (2) the now existing Hüttenzechen will have a great advantage in the future in expanding their coal production compared with companies engaged solely in mining.

Mines producing less than their allotted share are al-

<sup>1</sup> *Supra*, June 19, 1903.

<sup>2</sup> *Id.*, July 22, 1903.

<sup>3</sup> *Id.*, July 22, 1903; *Industrie Zeitung*, May 15, 1903.

lowed a compensation, and mines producing more than the same are obliged to pay a contribution, which is fixed at a minimum of 1.50 marks per ton.<sup>1</sup> The Umlage, as stated above, is limited to 3 per cent., unless an extraordinary majority of nine-tenths is obtained for a higher assessment. It is specially provided that where the syndicate has been compelled to sell coke or briquets below the accounting price, the difference shall be made up to the mine supplying the same, for which the means shall be acquired by the assessment of the coke or briquet producers respectively.<sup>2</sup>

The selling functions of the syndicate under the new agreement remain practically unchanged. Excluded from sale by the syndicate are all coal, coke and briquets destined, (1) for the mines and other works whose consumption is reckoned as Selbstverbrauch, (2) for neighborhood sale, excluding the regular supply of works, (3) for officials and employees, (4) for charitable purposes, and (5) for gas coke.<sup>3</sup>

Certain provisions are introduced for the protection of the syndicate against outsiders. An extraordinary feature is the rule that for the purpose of meeting competition those provisions which hinder the successful conduct of the business may be temporarily suspended. A three-fourths vote is necessary to effect this.<sup>4</sup> It is also provided that the members of the syndicate may not sell any mines or coal fields to non-members without the assent of the assembly of mine-owners. Further, outsiders may not be permitted to utilize the shafts of

<sup>1</sup> *Kartell-Rundschau*, 1903, pp. 741-2.

<sup>2</sup> *Kölnische Ztg.*, June 19, 1903.

<sup>3</sup> *Id.*, July 22, 1903.

<sup>4</sup> *Id.*, July 22, 1903; *Industrie Ztg.*, 1903, p. 219.

a syndicate member for getting out coal, etc., unless they acquired the right prior to the establishment of the new agreement.<sup>1</sup>

Finally, we may note the provision that differences of opinion between the contracting parties concerning the interpretation of the treaty are to be settled by a court of arbitration.<sup>2</sup>

A consideration of the new compact makes it clear that another step has been taken in the gradual evolution of the industry towards unity and economic power. The *Kölnische Zeitung* says: "there can be no doubt that the syndicate, with the help of the provisions of the new agreement, can control the coal market far more effectively than hitherto, and hinder the emergence of fresh competition much more easily."<sup>3</sup> That this is the general expert opinion is evidenced by the advance of coal stocks, as soon as the success of the new agreement seemed assured.<sup>4</sup>

*Recent Developments.* In general it is too early to speak of the effects of the new agreement in practical operation, nor is it within the scope of this inquiry to discuss the operations of the cartell since 1902, but there have been some developments in the most recent period, which, on account of the character of the problem and the interest it has excited, demand at least a brief reference. The question is concerning the purchase and abandonment of several unprofitable mines and the consequent loss of employment by laborers and economic injury to those communities

<sup>1</sup> *Kölnische Ztg.*, July 22, 1903.

<sup>2</sup> *Id.*, May 11, 1903.

<sup>3</sup> *Id.*, July 22, 1902.

<sup>4</sup> *Tageblatt*, Sept. 16, 1903.

wherein the mines are located.<sup>1</sup> According to an official statement, recently made in the Abgeordnetenhaus by Minister Moeller, there have been in all, since the formation of the new agreement, ten mines sold, or about to be sold. Including one mine previously shut down, the total number of employees affected was 12,500, and the total production about 2,530,000 tons. Of these only three mines proved profitable in recent years,<sup>2</sup> and in two of these cases the shut down is only for small shafts belonging to the mines, while for the third it is only temporary. The eight unprofitable mines produced about 1,330,000 tons in 1902, and paid 2¼ million marks in assessments.<sup>3</sup>

The dismantling of these mines appears to have created some excitement in the coal region, in the press and in the German and Prussian legislatures. Interpellations were brought in, in both the Reichstag<sup>4</sup> and the Abgeordnetenhaus. In the latter assembly Minister Moeller replied, and said that, while the information in the possession of the government did not show actions of the unjustifiable and injurious character alleged, particularly as to the non-employment and destitution of mining labor, yet it was the purpose of the administration to send a commission to the Ruhr to inquire into the matter. He characterized the whole agitation

<sup>1</sup> Hamburg u. Franziska (purchased by Gelsenkirchen), Stock u. Scherenburg (by Deutschland), Bommerbänker (by Mt. Ceniz), Gen. Blumenthal and Alstraden (by Hibernia), Hasenwinkel (by Friedlicher Nachbar), Julius Philipp (by Arenberg'sche, A. G.), Bochumer Koks u. Kohlenwerke (by Constantine d. Grosse), Maria Anna u. Steinbank, Eiberg and Bickefeld. *Frankfurter Ztg.*, Jan. 1, 1904; *Tageblatt*, April 25, May 1 and 5, 1904.

<sup>2</sup> Hamburg u. Franziska, Eiberg and Hasenwinkel.

<sup>3</sup> Report of debate in Abgeordnetenhaus, *Tageblatt*, April 16, 1904.

<sup>4</sup> *Id.*, April 22, 1904.

as an unreasoning panic, like that in a theatre when somebody cries fire.<sup>1</sup>

Whatever may have been the local hardship occasioned, it is quite beside the mark to lay the blame on the syndicate. Dr. Beumer remarked in the Reichstag that the unprofitable mines, except for the syndicate, would have been obliged to shut down long ago.<sup>2</sup> Herr Kirdorf pointed out, further, in his address in the annual meeting of the syndicate, that no power was conferred on the syndicate to forbid the transfer between members, and he had, therefore, refused to interfere, but, on the other hand, he had used his influence as a member of the Dortmunder Verein to induce those who had such action in view to carry out their plans gradually, and with due regard to other interests.<sup>3</sup>

In the discussion of the production policy of the syndicate (Part IV, Ch. I), this general problem is given due consideration, and the more recent events described here demand no further comment, nor an alteration of the conclusions arrived at there.

<sup>1</sup> *Supra*, April 16, 1904.

<sup>2</sup> Debate in Abgeordnetenhaus, *Supra*, April 17, 1904.

<sup>3</sup> Bericht d. Kohlen Syndicat, 1903, Anhang.

## CHAPTER II

### THE UPPER SILESIAN COAL CONVENTION

The coal convention of Upper Silesia (Ober-schlesische Kohlenkonvention) was formally organized in 1890 and has been renewed from time to time since, generally for three year periods. The present agreement runs until October 1, 1904, and its continuation thereafter is generally expected.<sup>1</sup> In form it is a simple mutual agreement without notarial certification. Originally it was merely a price cartell, at present, it is both a price and a sale cartell.<sup>2</sup> There is no agreement with Lower Silesia, although there have been some dealings between them.<sup>3</sup> The convention embraces about 94.3 per cent. of the private output of the district and 74.5 per cent. of the total output.<sup>4</sup> There are seventeen members in the convention including two firms of coal dealers who have no vote.<sup>5</sup>

*Organs and Powers.* The principal features of the agreement are as follows.<sup>6</sup> The general power of the convention is vested in a plenary assembly (Plenarversammlung). The plenary assembly is composed of representatives of the mines who are allowed one vote for every 100,000 tons output or fraction thereof. The mines under one administration are reckoned solidly. Besides the regular annual meeting, special meetings

<sup>1</sup> Enquete, pp. 334, 338.

<sup>2</sup> *Id.* pp. 334, 338, 327.

<sup>3</sup> *Id.* p. 358.

<sup>4</sup> *Id.* p. 556.

<sup>5</sup> *Id.* pp. 337, 555.

<sup>6</sup> The authority for the following analysis is the text of the Convention treaty unless otherwise noted.

may be called by the chairman of the convention, and such special meetings must be called if one-fourth of the vote representation demand it. For the determination of various questions, different majorities are required. Among the most important are the following :

(1) A majority of three-fourths is required for (§ 13)

(a) changes in the statutes where not otherwise provided for,

(b) changes in the normal minimum prices and price differences for different brands, sorts and railway differentials,

(c) exceptional rules for particular mines,

(d) possible termination of the convention before the time fixed.

(2) A two-thirds majority is required for,

(a) changes respecting the shipping permits,

(b) changes respecting exceptional prices and prices for distant markets (*Fernegebiete*). .

(3) A simple majority is required for all other determinations, especially elections, fixing participation figures, disposal of property of the convention, provision for possible assessments, etc. (§ 13).

The general representative of the convention, both for dealings with outsiders and with individual members is the chairman who is elected by the plenary assembly, together with two substitutes. These three form an executive committee which supervises and counsels the executive officer. This executive officer or business manager is also appointed by the plenary assembly, and it is his right and duty to attend and participate in its meetings. There is also an auditing board of two, chosen by the plenary assembly to audit the annual report. The plenary assembly meets



regularly every year in October; it hears the report, receives the accounts, fixes the budget for the ensuing year and elects officers, (§ 14). It will be seen that the general assembly has practically all the power and does all the work.<sup>1</sup>

The two principle features of the treaty, apart from the organization of the government, are the rules regarding prices and production. These can be changed by the general assembly, but the scheme, as fixed in the treaty, though undergoing some important quantitative changes, preserves its general character. The most original and the most important feature of the convention is the price regulation.<sup>2</sup>

The general principle of the Silesian convention is that minimum prices only are fixed; the individual mines may sell on their own account to whom they will and at any price they can obtain at or above the minimum price. Generally they sell above it. There is of course no selling bureau for the convention like the Rheinisch-Westfälische Kohlen Syndicat.<sup>3</sup> From the general provision that coal must not be sold below the minimum price, there are two exceptions: (1) all coal sold to the mining and smelting works of Upper Silesia, (2) unseparated coal under fifteen mm. in size.<sup>4</sup> The provisions of the convention agreement provide three norms for the determination of prices: (1) the brand (mine), (2) the sort (size), and (3) the location (freight differential).

<sup>1</sup> Enquete, pp. 334-5.

<sup>2</sup> No changes in prices were made in the first seven years of the convention. The present prices are slightly below those given in the published form of the treaty. *Id.* pp. 338, 360.

<sup>3</sup> *Id.* pp. 327, 329, 335.

<sup>4</sup> *Id.* pp. 328, 339, 542.

(1) In respect to the brand, the mines belonging to the convention are grouped and a reduction fixed (compared with the first class) as follows :

Class I a.	normal = 50 pf. per Zentner <sup>1</sup> for the best quality (in 1901).			
b.	1 pf. per Zentner reduction.			
II a.	3	"	"	"
b.	4	"	"	"
III a.	8	"	"	"
b.	10	"	"	"

(2) In respect to the sort, the coal is divided into three classes, viz. (a) separated coal, (b) run of the mine, (c) small coal. No other sorts may be sold. Class (a) includes coal mechanically separated by passing through gratings of not less than sixty mm. This coal is further separated and classified in seven sub-classes according to size. The best quality (Stück and Würfel) is sub-class  $\alpha$  which is obtained by passing the coal through a grating of not less than sixty mm. This furnishes the standard for the price scale. The six other classes are divided according to the size of the coal with price reductions as follows :

Sub-class $\beta_1$	(35-40 mm.),	5 pf. reduction.
" $\beta_2$	(30-35 " ),	7 pf. "
" $\gamma_1$	(25-30 " ),	9 pf. "
" $\gamma_2$	(20-25 " ),	15 pf. "
" $\delta_1$	(15-20 " ),	19 pf. "
" $\delta_2$	(10-15 " ),	23 pf. "
" $\zeta_1, \zeta_2$	{ under 10 " },	29 pf. "

Coal under 15 mm. not separated further is not regulated with respect to price. Class (b) includes "run of the mine" strictly, and is allowed a price reduction of 9 pf. Class (c) includes the unseparated small coal (Kleinkohlen), viz. the coal remaining when the Stück and Würfel are separated by gratings of not more than 70 mm. For this coal a price reduction of 17 pf. is

<sup>1</sup> Zentner = 50 kilos ; 20 Zentner = 1 metric ton.

allowed. There are some further minor points in this classification that need not be considered here. (§ 3)

(3). In respect to location and freight differentials the following price regulations are made. Kattowitz, a central point in the coal district, is made the price basis, *i. e.*  $\pm 0$ . The regions to which the coal is sent are divided into four divisions, and for each division, the mines are distributed into appropriate groups with respect to that market, and a freight differential allowed according to the distance. This freight differential is reckoned plus or minus the freight-base Kattowitz.<sup>1</sup> The four market divisions are:

I. Total inland market: there are 7 groups here with differentials ranging from  $+1\frac{1}{2}$  pf. to  $-1\frac{1}{2}$  pf.

II. Northwest Austria: there are ten groups here with differentials ranging from  $+1\frac{1}{2}$  pf. to  $-4$  pf.

III. Other Austria, part of Hungary, and also Roumania and Russia: there are fourteen groups here with differentials ranging from  $+2\frac{1}{2}$  pf. to  $-5$  pf.

IV. Other Hungary: there are nine groups here with differentials ranging from  $+1\frac{1}{2}$  pf. to  $-6$  pf. (§ 4)

The prices so established (net minimum prices) can be departed from in only three cases: (1) sales to Upper Silesian mining and smelting works, (2) sales to exception regions (*Ausnahmegebiete*), (3) summer sales. The last two exceptions are now to be considered. The exceptional regions are of two sorts. (1) The real exceptional regions, which are allowed to go in general 20 per cent under the minimum prices, *viz.* for districts a, b and c, which include approximately the stations on and near the Baltic and North Sea coasts, and Elbe stations from Magdeburg to Hamburg (also Great Brit-

<sup>1</sup>The area of the coal district is from 20 to 25 kilometers long by 8 to 10 kilometers wide. *Enquete*, p. 339.

ain). A special provision is made for (d) West Elbian points (except part of Dresden) for which all restrictions are removed. (2). The second rubric under the exceptional regions includes the so-called distant regions (*Fernegebiete*), for which a reduction of 2 pf. from the minimum price is permitted; they are approximately as follows, for districts A (East and West Prussia), B (Pomerania), C (the west, *i. e.*, west of a line through Fürstenberg i. M., Potsdam, Freiberg in Saxony, etc.; this seems to conflict with exceptions region d), D (water shipments from points on the Oder from Stettin to Frankfurt am/O., from points on the Warthe from Küstein to Landsburg and points on the Havel from Potsdam to Fürstenberg i. M.) (§ 6). This is a very complicated scheme (much more so in the original), but it shows in an interesting way the competitive regions. The regular reduction allowed for summer prices applies to sales between April 1 and August 31 of sorts not under 30 mm. The reduction is 3 pf. per Centner. For certain sorts which contain mixed sizes above and below 30 mm. special arrangements are to be made. The summer prices are also allowed in March and September for certain water shipments on the Oder and the Przemsza (§ 7). By exceptional regulations the minimum prices to Russia have sometimes been fixed lower than provided above and sometimes made entirely free.

We come now to the regulation of shipment which is in effect, a regulation of production. The cartell applies to,

- (1) All shipments on the main-line railways.
- (2) Such shipments on the local narrow-gauge road as are destined to water shipment at the Klodnitz canal near Gleiwitz.

<sup>1</sup> Enquete, p. 357.

This includes all but about 20 per cent. of the total production of the convention mines.<sup>1</sup> The participation figures for the cartelised shipments are fixed annually for each mine (*Verhältniszahlen*) on the basis of the actual shipment of the preceding year, and in general these are the same. The participation figures are divided correspondingly into (unequal) quarterly participation figures. These are made the basis for the grant of the quarterly shipping allowances (*Versandlizenzen*) which are proportional thereto. If no shipping allowance is determined, the participation figure for that quarter stands instead. In case a mine, through interruption of production, did not have a normal output in a given quarter of the preceding year from which to reckon the participation and allowance figures then the general percentage of the convention may be taken as a basis instead. In general, the amount of the allowance figure is not given but a percentage plus or minus on the allowance of the previous year. Mines under the same administration can transfer their allowances. Deferment of shipment may be granted by the plenary assembly to the extent of five per cent. from one quarter to the succeeding one; a more extensive modification of the rule requires a three-fourths vote. In case the actual shipment of a mine in a given year is less than its participation figure in the business year 1901-02, it can demand the latter as a basis for reckoning its current participation and allowance. Some further minor provisions are made respecting allowances in case of interruption of operations through accident etc. (§ § 8, 9, 10, 11, 12). In the early years of the convention, special arrangements existed for the new and undeveloped mines, but now the general regu-

<sup>1</sup> *Enquete*, p. 328.

lations apply to all.<sup>1</sup> It may be mentioned here that the shipping allowances have been reduced for only two years (1892 and 1902), and all limitations on shipment were removed in 1900 and the first quarter of 1901.<sup>2</sup>

Further important provisions of the treaty are as follows: Exceptions to rules may be allowed to individual mines by a three-fourth vote of the plenary assembly when the enforcement of the same would cause disproportionably great injury or with regard to the necessities of competition with non-convention mines (§ 15). Fines are provided for the non-fulfillment of the terms of the treaty. (1) In the case of sales below the minimum price, the plenary assembly has the right to assess the damages caused thereby up to an amount equal to the difference between the actual proceeds on the quantity so sold and the amount that would have been received, if the regular price had been charged. For the determination of the fact of such a sale and the price of the same, the mines obligate themselves to allow the business manager of the convention a confidential examination of their books and papers. (2) In the case of shipments in excess of the shipping allowance, a fine is provided of 200 marks for every hundred tons so shipped. For the determination of the fact, the mines are bound to allow a confidential agent appointed by the plenary assembly to examine their books and papers, etc. (§ 16). As a matter of fact, it appears that the penalty for underselling has never been required,<sup>3</sup> but considerable amounts have been levied for excess shipments<sup>4</sup>. The amounts so obtained

<sup>1</sup> Enquete, p. 338.

<sup>2</sup> *Id.* p. 329.

<sup>3</sup> *Id.* p. 343.

<sup>4</sup> *Id.* pp. 340, 344.

have been used to pay (besides ordinary expenses) for building a house for the Oberschlesischen Berg- und Hüttenmännischen Verein, (300,000 m.), for improving the harbor at Oppeln, on the Oder (250,000 m.), a contribution to the technical school at Breslau (over 100,000 m.), experiments in heating (50,000 m.), etc.<sup>1</sup> Provision is made for assessments (Umlage), if necessary, to cover the costs of operation which are to be apportioned according to voting power (§ 18). New mines, acquired by the members of the convention, come under its provisions *ipso facto*. This includes new deep shaft mines, but they are not to be restricted in their shipments between Oct. 1, 1901 and Oct. 1, 1904 (§ 19). The provisions of the treaty are made binding for successors, together with the obligations incurred by the previous members, (§ 20).

The convention of Upper Silesia is evidently a much looser organization from a formal standpoint than that of the Ruhr. But as the mines are few and the owners intimately associated, the need of a closer organization is not felt.<sup>2</sup> It has been called a "family affair".<sup>3</sup>

<sup>1</sup> Enquete, p. 340.

<sup>2</sup> *Id.* p. 341 (Williger).

<sup>3</sup> *Id.* p. 342.

## PART IV

### ANALYSIS OF THE OPERATION OF THE CARTELLS

#### CHAPTER I

##### PRODUCTION OF COAL

The first topic, logically, in the examination of the cartells is production. We should consider first, the quantity produced by the cartells as compared with the total production and in relation to the demand, secondly, the policy of the cartells in the regulation of output, and thirdly, the relation of the cartells to the economy of production and quality of product.

The total production of Steinkohle in the German Empire in 1902 was 107,436,334 tons,<sup>1</sup> of which 100,115,315 tons were produced in Prussia. Of this latter amount, 58,626,580 tons were produced in the Ruhr district, or 58.56 % of the total output of Prussia, 24,485,368 tons or 24.46 % of the same in Upper Silesia and 9,493,666 tons in the fiscal mines of the Saar, or 9.48 % of the total.<sup>2</sup> Or, taking these three chief districts together, we have an output of 92,605,614 tons, or 92.5 % of the Prussian production. These proportions have been tolerably constant for the last ten years. The fiscal mines of the Saar embrace practically the whole output of that region, and act for all practical purposes as a cartell or rather a fusion or trust ; hence in estimating the influence of combinations on production, prices, etc.,

<sup>1</sup> *Vierteljahrshefte*, 1903, II. p. 101.

<sup>2</sup> Bericht d. Kohlen Syndicate, 1902, p. 8.



they should be considered as occupying much the same position. The syndicate mines of the Ruhr produced 48,609,645 tons or 48.55% of the Prussian output (82.8% of the Ruhr production), the Upper Silesian convention produced 18,239,543 tons, or 18.2% of the Prussian output (and 74.4% of the output of Upper Silesia). Taking these three combinations alone, we have an output of 76,342,854 tons, or 76.2% of the total of Prussia. But the fiscal mines of Upper Silesia are practically pooled with the convention,<sup>1</sup> while the mines of the Wurm district are in close relations, not only with each other, but also with the Ruhr. Further the mines of Lower Silesia are all cartelled, and, outside of Prussia, in Saxony, is the cartell of the Zwickau mines. But simply adding the production of the Lower Silesian cartell and the fiscal mines of Upper Silesia to the three chief combinations named above, we have an output of about 85,760,000 tons or approximately 85% of the total Prussian production.<sup>2</sup> It would be fair to say, therefore, that at least 85% of the present production is in the hands of five organizations which, for most of their business, are governed by non-competitive principles.

The outsiders find their chief strength and significance directly in the territory of the strongest German cartell, viz. in the Ruhr. The total production of that region in 1902 was 58,626,580 tons, of which 10,016,935 tons came from non-syndicate mines.<sup>3</sup> The mines in Upper Silesia not included in the convention, nor owned by the fiscus, had an output in 1902 of 1,094,-

<sup>1</sup> Enquete, p. 344.

<sup>2</sup> The fiscal mines of Upper Silesia produced 5,136,827 tons in 1902. Enquete, p. 556. The production of the Breslau district was 4,283,188 tons in 1901. *B. H.-u. S.* 1902, p. 3.

<sup>3</sup> Bericht d. Kohlen Syndicat, 1902, p. 8.

418 tons.<sup>1</sup> The considerable amount of non-syndicate production in the Ruhr loses a large part of its significance from the standpoint of competition when it is considered that the greater part of it belongs to blast furnaces and other consumers and does not come into the general market.<sup>2</sup> In Upper Silesia the deduction on this account is not so important.<sup>3</sup> Further, the convention does not regulate the whole of the output of its members, but only the main line shipments,<sup>4</sup> *i. e.* 59.1%. Nevertheless the control over production is fairly complete.

The first question that we have to ask concerning the policy of the cartells is their influence on the quantity of production. Experience shows that in a growing country, increasing, that is, not only in population, but also in industrial activity, the normal supply of wants must be met by a production that increases not only positively but relatively, compared with the increase of population. There is no known norm to measure the extent of this need, but a comparison with the population affords a useful guide, especially in connection with similar figures of other countries. The production of coal is to a considerable degree under the control of the pro-

<sup>1</sup> Enquete, p. 556.

<sup>2</sup> Five iron concerns own ten mines with a production of 3,512,711 tons, for each of which a contract exists that any surplus product shall be sold by the syndicate. (Hannover, Sälzer u. Neuack, Hasenwinkel, Maria Anna u. Steinbank, Engelsburg, Westende, Glückauf Tiefbau, Carl Friedrich Erbstollen, Adolf v. Hasenmann and Hörder). Besides these there are at least five other large mines belonging to iron producers with an output of about 3,493,875 tons which presumably do not sell much coal. (Hannibal, Deutscher Kaiser, Oberhausen u. Osterfeld, Hugo, Minister Achenbach). Steinkohlenzechen, pp. 100-1.

<sup>3</sup> One mine, "Consol. Hultschiner," output, 286,765 t., belongs to a smelting company. *Statistik Oberschl. B. u. H.* 1902, pp. 8, 25.

<sup>4</sup> Enquete, p. 345.

YEAR.	(1)		(2)		(3)		(4)		(5)		(6)					
	Popula. of Empire.		Production of Empire.		Exp.		Imp.		Inland Consumption.		Prussian Production : Chief Districts and Percentages.					
	In 1000.		1000 Tons.		1000 Tons.		1000 Tons.		1000 Tons.		Ruhr.		Ruhr Syndicate.		Fiscal Saar.	
		Per Cap.									1000 Tons.	Per Cent.	1000 Tons.	Per Cent.	1000 Tons.	Per Cent.
1892	50,266	1.419	71,372	8,971	4437	36,969	56.30	66,838	1.329	-----	6358	9.56	16,437	25.13	-----	-----
1893	50,757	1.455	73,852	9,677	4664	38,702	57.20	68,839	1.356	33,539	5883	8.70	17,109	25.27	-----	-----
1894	51,339	1.494	76,741	9,739	4806	40,734	57.66	71,808	1.398	35,044	6591	9.33	17,204	24.35	-----	-----
1895	52,001	1.522	79,169	10,361	5117	41,734	57.47	73,925	1.421	35,347	6886	9.48	18,066	24.88	-----	-----
1896	52,753	1.624	85,690	11,599	5477	45,008	56.98	79,568	1.508	38,916	7705	9.75	19,613	24.83	-----	-----
1897	53,569	1.699	91,055	12,390	6072	48,519	57.59	84,737	1.581	42,195	8258	9.80	20,627	24.48	-----	-----
1898	54,406	1.770	96,310	13,989	5820	51,306	57.28	88,141	1.620	44,865	8768	9.79	22,489	25.11	-----	-----
1899	55,248	1.839	101,640	13,943	6220	55,072	58.13	93,917	1.699	48,024	9025	9.53	23,470	24.77	-----	-----
1900	56,046	1.950	109,290	15,276	7384	60,119	58.96	101,398	1.809	52,080	9397	9.22	24,829	24.35	-----	-----
1901	56,862	1.958	108,539	15,266	6297	59,004	58.30	99,570	1.751	50,411	9376	9.26	25,251	24.95	-----	-----
1902	57,708	1.859	107,303	16,101	6426	58,626	58.56	97,628	1.691	48,609	9493	9.48	24,485	24.46	-----	-----

(1) *Jahrb. d. Deutschen Reiches*, 1903, p. 2.(2) *Ib.* p. 46. Bericht d. Kohlen Syndicat, 1902, p. 11.(3) *Dortmunder Jahrb.*, 1901, p. 581. Bericht d. Kohlen Syndicat, 1902, p. 11.(4) *Dortmunder Jahrb.*, 1901, p. 581. Bericht d. Kohlen Syndicat, 1902, p. 11.(6) *Ib.* p. 8.

ducer as respects the amount (though not so exactly as most manufactured products); the question here is, have the cartells limited production unduly, as their opponents often claim.

This table shows a very considerable increase both in production and consumption *per capita*; respectively, 23.7 per cent. and 21.4 per cent. The increase in production has been distributed with remarkable evenness among the different districts, but it is noticeable that the Ruhr syndicate showed a relatively greater increase until the crisis, and since then, a decline. The *per capita* consumption in Germany does not approach that of England, but it greatly exceeds that of France; the two countries with which it can be most fairly compared. A recent English table gives the consumption of various countries from which the following figures are taken.<sup>1</sup>

	United Kingdom.	Germany.	Belgium.	France.	United States.
1883-----	3.79	1.08	2.45	0.81	1.91
1886-----	3.50	1.11	2.22	0.74	1.75
1890-----	3.81	1.30	2.68	0.91	2.23
1893-----	3.30	1.32	2.35	0.89	2.43
1894-----	3.75	1.35	2.56	0.94	2.22
1895-----	3.75	1.38	2.55	0.95	2.46
1896-----	3.82	1.47	2.65	0.98	2.41
1897-----	3.87	1.54	2.70	1.02	2.47
1898-----	3.83	1.58	2.75	1.06	2.65
1899-----	4.05	1.66	2.83	1.11	3.00
1900-----	4.08	1.77	2.95	1.19	3.08
1901-----	3.89	1.71	2.81	1.15	3.29

The consumption of England is very large but, apparently, is not increasing. Germany, on the other hand, has recently begun the development of industries on a large scale and a rapid advance in the *per capita* figures of coal consumption must be regarded as a normal circumstance. That the cartells have done their share towards supplying this need may be seen from the following table:

<sup>1</sup> Coal Tables, Board of Trade, 1901, pp. 32-3.

Year	Ruhr Syndicate.				Upper Silesia.			
	<sup>1</sup> (1) Product'n.	(2) Export	Consumption.		(3) Product'n.	(4) Export	Consumption.	
	1,000 t.	1,000 t.	1,000 t.	% of Total.	1,000 t.	1,000 t.	1,000 t.	% of Total.
1896	38,916	4,688	34,328	43.1	19,613	4,613	15,000	18.8
1897	42,195	4,964	37,231	43.9	20,627	4,483	16,144	19.0
1898	44,865	5,644	39,221	44.5	22,489	4,930	17,559	19.9
1899	48,024	5,648	42,376	45.1	23,470	4,909	18,561	19.8
1900	52,080	5,861	46,219	45.6	24,829	5,516	19,313	19.0
1901	50,411	6,063	46,348	46.5	25,251	5,279	19,972	20.0
1902	48,609	6,870	41,739	42.7	24,485	5,076	19,409	19.9

The Ruhr Syndicate supplied the domestic market at an increasing ratio until 1900, but after that the production declined and the export increased. This is the proper theoretical policy of a cartell, *i. e.* the accommodation of supply to demand in the domestic market. The same tendency appears in Upper Silesia. The quantity of coal produced and offered for domestic use seems to have been, in general, large enough to cover all reasonable demands. Raffalovich, indeed, thinks that production has developed too fast, and that it exceeds the present power of consumption,<sup>2</sup> and Calwer, writing in 1901, says that it will soon be greatly in excess of the power of consumption.<sup>3</sup> Both of these writers are opponents of the cartells.

In some respects, the problem of the accommodation of supply to the demand is much simpler for coal than for many manufactures, for example, iron, because the uses of coal to a considerable extent are of a tolerably constant character and not very elastic. This is true, for example, of house-heating, lighting, locomotive consumption, etc., while industrial consumption is so varied

<sup>1</sup>(1) and (3) Bericht d. Kohlen Syndicat, 1902, p. 8. (2) and (4) Enquete, pp. 280, 557.

<sup>2</sup> Raffalovich, p. 65.

<sup>3</sup> Calwer 1900, p. 8; Cf. also X Commission, p. 10.

that only the severest shock can greatly curtail its use. Indeed one of the chief difficulties to contend with is the seasonal variation.<sup>1</sup>

In the case of coal, the difficulties of accommodating supply to demand are rather in production. The coal deposits are not absolutely known quantities in many cases nor capable of extraction according to absolute calculations of time and labor; the seams may thin out unexpectedly; the progress of mining may be interrupted by flooding, squeezes, explosions, etc. The development of new shafts and workings often necessitates an interruption of regular mining. In a great mining district, the calculation of the effects of even the calculable events is not a simple one. Other technical difficulties occur in the productive process, notably, strikes of miners, car famines, low water in canals and rivers or the freezing of the same, which either prevent the calculated output or shipment. The checking of shipments through lack of storage space may lead to a necessary retardation of production. Storage, moreover, cannot be increased indefinitely, because coal held long in storage suffers a serious deterioration in power. These and other circumstances of the industry have an immediate and practical bearing on the question of supply, and at some critical junctures they are of capital importance.<sup>2</sup> Labor difficulties, strikes, shortness

<sup>1</sup> In the Convention of Upper Silesia they attempt to counteract this by price reductions during the summer months. Enquete, p. 357.

<sup>2</sup> Owing to these interruptions, the Ruhr syndicate in 1899 established a standing committee to have the oversight of the question of disturbances to production. *Industrie Ztg.*, Jan. 25, 1889. Car famines are likely to occur, especially in the autumn with the movement of the beet crop, and in the winter in consequence of snow storms. The freezing of railway lubricants in Dec., 1899 seems to have been an important factor in the coal famine. See *Stahl. u. Eisen*, 1900, pp. 155-8.

of hands, "blue Mondays" etc. seriously interrupt work. There has been no strike of importance in the Ruhr, however, since 1889.

The output cannot be determined exactly, therefore, by any mine or combination of mines,<sup>1</sup> but it can be determined probably quite as accurately as the demand. For the estimate of the demand, historical and statistical data are of primary value. There are three important factors which enter further into the calculation, namely, the weather, the industrial situation and coal imports. In Silesia the weather is the dominant factor, in the Ruhr the *conjunctur*,<sup>2</sup> and in Hamburg, probably, the imports. The regulation of production is accomplished in the Ruhr syndicate by a careful estimate of the productive capacities of the various mines, and the allowance of an ideal figure of participation (quota) which furnishes the base for the actual allowance. Where these calculations have been made on an inadequate estimate of demand, they have always been increased. Within the limits set by its price policy the syndicate has, naturally, always endeavored to satisfy the demand. In 1899, when the home demand proved stronger than was anticipated, the contracts on foreign orders were partly filled by coal bought abroad in order to release as much as possible of the local production for the domestic market.<sup>3</sup> The participation figures allotted to the mines might be greater or less without affecting the theoretical operation of the syndicate simply by changing the contraction or proportionate

<sup>1</sup> And especially not by the cartels when they do not control the whole of the production. Cf. Kirdorf, *Cent. Verband, D. I.*, 1901, p. 245; *Denkschrift*, pp. 8-9.

<sup>2</sup> Renauld, p. 76.

<sup>3</sup> *Bochum, Hk.*, 1899, p. 52.

reductions of output. Historically, however, and practically, they are estimates of the actual capacity (in some cases past capacity) of the mines, the combination having been formed originally on the principle that each mine ought to participate in the sales in proportion to its capacity. With the course of time, some mines acquire a greater potentiality of production while others become relatively exhausted; in the first case, they may demand an increase in their allowance, which must be granted if the conditions of the market justify it, in the second case, however, they cannot be reduced.<sup>1</sup>

The determination of a participation figure in itself carries with it the principle of restriction of output, and it was originally so intended independently of the imposition of contractions of the same. This would take effect principally through preventing a scramble for the increase of production. But it was not intended, on the one hand, to absolutely prevent an increase of capacity, nor on the other hand, to allow in every case the complete use of the capacity developed. The first statement is shown to be true by the fact that the participation figures have been increased, from 33,575,976 tons at the organization of the syndicate, to 62,196,437 tons at the beginning of 1903—an increase of 85.25%.<sup>2</sup> The second statement is proved by the frequent contractions of production.

The rapid increase of the participation figure was stimulated, and indeed made possible, by the extraordinarily favorable *conjunctur*. The following table shows the development of these quotas. The participation figure may be taken at the yearly rate at a given day, or

<sup>1</sup> Cf.; *Central Verband D. I.*, 1901, pp. 231-2.

<sup>2</sup> *Bericht d. Kohlen Syndicat*, 1902, p. 6.



at an aggregate of the changing monthly allowance throughout the year. The second quantity forms the basis for actual output and contraction, and it is sufficient to give that here :<sup>1</sup>

<i>Tons.</i>	<i>Tons.</i>
1893-----35,371,917	1898-----49,687,590
1894-----36,978,603	1899-----52,397,758
1895-----39,481,398	1900-----54,444,970
1896-----42,735,589	1901-----57,172,824
1897-----46,106,189	1902-----60,451,522

The participation figures are not only often in excess of the capacity of individual mines ; but this is true in general for the whole cartel, first, because there are practically always some interruptions to their continuous exploitation, and secondly, because they often obtain allowances in excess of what they can ordinarily produce. Some mines, on the other hand, have been able to increase their capacity beyond the amount of their participation figure and, for one cause or another, have not procured an increase of the same. These, in an emergency, are able to produce more than their prescribed quota, and sometimes they have the opportunity to do so. Thus in 1898, it is reported that some mines were far behind their quotas while others were producing in excess.<sup>2</sup>

The syndicate aims to make coal mining profitable. It is not opposed to an increase of the participation figures and of production when that is a profitable policy ; on the other hand, it does not aim at the greatest production technically possible under the existing conditions. This is sometimes held up as a duty of the syndicate, but such a claim is a palpable absurdity. According to the same principle, it might be demanded that the number of mines in the coal fields be doubled,

<sup>1</sup> Bericht d. Kohlen Syndicat, 1902.

<sup>2</sup> *Industrie Ztg.*, 1898, p. 491.

quadrupled, etc., in order to produce more. This would be technically possible, but economically, it would be very foolish and wasteful. It may be the duty of the syndicate to increase the productive capacity under given conditions of market and cost of production, but exactly these circumstances may require it to contract production. Since the development of productive capacity, through the individual interests of the mines, has always tended to increase faster than the demand, the syndicate does not find it necessary to stimulate the movement; on the other hand, it is often compelled to check this movement in the interest of the whole. This is accomplished through the system of contracting the output, that is, allowing a mine to produce only a percentage of its theoretical capacity. This is an indispensable function of the syndicate. The contraction is generally expressed in a percentage which is to be deducted from the participation figures, but it is actually formed on an estimate of what quantity can be disposed of under certain presuppositions as to price. Thus it is officially explained that in the first quarter of 1901 the participation figures amounted to 14,007,000 tons; while it was estimated that there was an opportunity for sale, (under a tacit assumption as to the price scale, of course), of 12,600,000 tons. On this basis a contraction of 10% was in order.<sup>1</sup> In this case, as in every other, the contraction was not irrevocably fixed, that is, if the market permitted it, nothing prevented the syndicate from increasing production and sale. As a matter of fact, it has generally been true that the pre-determined or projected contraction was greater than that actually required and put into effect. The contraction is generally determined

<sup>1</sup> *Denkschrift*, p. 17.

for a month or for a quarter but sometimes for a longer period. Taking the yearly averages, the projected and actual contractions have been as follows :<sup>1</sup>

	<i>Projected Contraction.</i>	<i>Actual Contraction.</i>
1893(5 months) -----	12.00%	2.44 %
1894-----	11.75 "	4.98 "
1895-----	12.08 "	10.45 "
1896-----	12.50 "	8.705 "
1897-----	0.83 "	6.038 "
1898-----	8.55 "	7.50 "
1899-----	3.75 "	6.33 "
1900-----	0.00 "	4.34 "
1901-----	13.75 "	11.83 "
1902-----	23.00 "	19.59 "

In the cases (1897, 1899 and 1900) where the actual contraction was greater than the proposed contraction, the cause was in the inability of the mines to meet the demands made on them. The actual contraction for each year varies considerably from month to month, and this without any corresponding change, or no change at all, in the plan of output. This is another illustration of the fact that the conditions of production are not perfectly under control. Although all limitations on production have been removed in the aggregate for twenty-five months (last ten months of 1897, last three months of 1899, and twelve months in 1900), in only two instances, namely, Nov., 1894 and Nov., 1900, has the actual output equalled or exceeded the participation figures. (See next page.)

The contraction of production has been a favorite subject of animadversion by hostile critics who find in it an attempt to create a scarcity value for coal. This, for example, is the attitude of Graf Kanitz. To the explanation of its apologists that this contraction means simply the accommodation of supply to the demand,

<sup>1</sup> *Reichslag*, 1902, p. 6139; *Berichte d. Kohlen Syndicat*.

MONTHLY CONTRACTIONS, RH.-W. KOHLEN SYNDICAT.  
(IN PER CENT.)

Month	1894	1895	1896	1897	1898	1899	1900	1901	1902
Jan.	—	11.00	3.50	4.95	7.42	2.99	4.65	8.87	19.99
Feb.	1.39	8.00	10.38	3.56	6.14	1.50	5.46	8.30	21.45
Mar.	2.87	9.00	11.70	6.07	7.25	0.62	4.05	8.60	22.02
Apr.	10.91	13.00	11.85	9.31	11.99	8.53	6.85	10.63	22.35
May	7.00	14.00	11.44	6.82	8.73	8.35	4.45	9.21	18.17
June	5.50	14.00	11.51	8.09	8.48	7.48	5.54	8.33	20.52
July	9.00	14.50	10.91	7.36	7.05	8.12	5.25	13.72	23.37
Aug.	11.25	13.00	10.47	6.70	9.50	8.83	4.49	15.17	20.54
Sept.	5.50	15.00	8.20	5.61	8.69	7.10	4.49	14.15	20.29
Oct.	4.50	12.00	7.79	8.33	7.54	8.59	4.25	16.73	17.85
Nov.	+0.51	3.15	3.33	3.48	3.15	2.38	+0.57	12.25	12.52
Dec.	0.50	2.12	3.35	2.04	3.98	10.28	1.60	14.48	15.74
	4.98	10.45	8.71	6.02	7.50	6.33	4.34	11.82	19.57

Calwer, 1901, p. 100; Berichte d. Kohlen Syndicat, 1900-1902.

Graf Kanitz says that a greater sale could be made if they would lower their prices.<sup>1</sup> This answer is, *a priori*, a fair one in general, but, without anticipating the discussion of price policy too far, it may be observed that, though it is plausible, it is by no means conclusive, since the elasticity of demand must be considered before drawing a conclusion. The Denkschrift of the Verein answers this criticism respecting the syndicate's price policy in 1901 by the statement that the contraction was determined subsequently to the contracts of sale in which the price was fixed for the ensuing year, namely:—the contracts and prices were made in the autumn of 1899 and the contraction in December, 1900, for the first quarter of 1901; and it concludes, therefore, that the contraction "has nothing to do with the determination of prices."<sup>2</sup> This goes too far in the other direction, so far as it pretends to answer the general charge (though perhaps not for this or other particular occasions); because the very essence of the cartell is a

<sup>1</sup> Reichstag, 1901, pp. 1331-3, Feb. 12.

<sup>2</sup> Denkschrift, p. 8.

combination for the regulation of production and price, and the establishment of a high price may oblige them to make a heavy contraction, or the establishment of a heavy contraction may give them an opportunity to demand a high price. The two go, however, so to speak, hand in hand, even though they do not keep in step. But it should be remarked further, in regard to the syndicate's policy, that when the contracts already made at a fixed price do not cover the whole possible output, and when the outlets in the way of export have been availed of so far as practicable ; it is not to be reproached for contracting the output rather than to supply late-comers at cut prices (as a means of selling a greater quantity) ; because this would put their previous, regular customers, whether producers or dealers, at an unfair competitive disadvantage. The policy of contraction, finally, is merely a common business practice put into operation by a method adapted to the cartell organization.

The fiscal mines do the same thing in the budget or *état*, for the ensuing year.<sup>1</sup> They estimate how much coal they should produce, not how much coal they will be able to produce at the limit of capacity. If the situation is encouraging, they may enlarge their plant and extend their operations, and this has been the case generally from year to year, but, if the mines are to be worked at a profit, and this is the principle purpose for which they are worked, they must have regard to the market, and diminish, or at least limit, the scale of their production if the situation makes it seem advisable. The contraction of production, therefore, is a perfectly normal and proper business method in itself, and not

<sup>1</sup> X Commission, 1901, pp. 11-12 ; Reichstag, 1902, p. 6139.

necessarily a means of extortion, though it might be perverted to that use by causing an abnormal scarcity. Cases of contraction must be judged on their merits and with reference to prices, costs and other material facts.

The regulations of the syndicate concerning the transfer of participation figures are of great importance. We may note, first, that the treaty provides that the rights of participation of a number of mines owned in common or operated in respect to sale as a unit are to be treated as a unit in respect to the supply of their quotas.<sup>2</sup> A combination of two or more independent mines for purposes of sale is sometimes found advantageous, because an interruption in production in one can be made up by an extra output in the other, etc.<sup>3</sup> Much more significant are the acquisitions of poor mines by rich mines with the sole purpose of succeeding to the rights of participation belonging to the latter, in order to transfer production to the richer deposits. A recent case of this sort was the purchase of the mine Steingatt by the Concordia A.G., and the shutting down of production in the former. Concordia calculated that its participation figure was 15% below its full capacity which the contraction existing at that time had made about 35%; and it was estimated that this involved an increase in the cost of production of 50 pfgr. per ton. On the other hand, Steingatt was not

<sup>1</sup> Vertrag, Kohlen Syndicat, § 2.

<sup>2</sup> Such combinations exist or have existed, for example, in the Stinnes mines (Carolus Magnus, Friedrich Ernestine, Graf Beust, Matthias Stinnes, and Victoria Stinnes), between Lothringen and Graf Schwerin, between Louise Tiefbau and ver. Wiendahlsbank, between ver. Rosenblumendelle and Mülheimer Bergwerk, between Portingssiepen and Rheinische Anthracit and between Pauline and Richardt. *Dortmunder Jahrbuch*, 1901, p. 543.

profitable on account of water in the mine but nevertheless, possessed a participation of 216,376 tons. It was calculated that by taking over this right of participation the cost of production, for the whole of Concordia's previous output, would be reduced thirty-three pfg., while a further profit would accrue on account of the additional amount of production of about 1.95 m. per ton.<sup>1</sup>

The method of regulating output in Upper Silesia is similar, the cardinal difference being that the allowances granted are not for total output but for shipment on the broad gauge railways. So far as this excludes the quantity used by the mines for their operation (*Selbstverbrauch*), this system is preferable. The quota for each member of the convention (*Hauptbahn-Ver-sandlicenz*) is generally fixed quarterly,<sup>2</sup> but, outside of the regular apportionment, special licenses to ship may be given by the general assembly.<sup>3</sup> The contraction or expansion of shipping licenses is made on a percentage basis of the shipment of the preceding period. Since the beginning they have been reduced twice, namely, in 1892 and 1902, but in 1900 and for a part of 1901, the usual limitations on shipment were entirely removed.<sup>4</sup> For the mines severally, the percentage of the shipping license to the total output varies considerably, excluding three exceptional cases, the percentage ranges from 61.2 to 78.8.<sup>5</sup> (See table on next page).

<sup>1</sup> Enquete, pp. 39-41, 243-4. In the calculation of the value of Steingatt's participation the term of the syndicate treaty was of course an important factor, and also the probability of its renewal.

<sup>2</sup> *Id.* pp. 335, 337-8.

<sup>3</sup> *Id.* p. 335. This happens especially when the market proves slow to take certain sorts or brands. With respect to certain new mines in 1890 no limitations were placed at first on the right to ship, p. 338.

<sup>4</sup> *Id.* pp. 329, 338.

<sup>5</sup> *Id.* p. 555.

CONCERNS.	Output in 1902. Tons.	License 1902-1903. Tons.	Per Cent.
1. v. Giesche's Erben.....	2,660,432	1,995,583	75.0
2. Kattowitz A. G. ....	2,426,329	1,660,613	68.4
3. Ver. Königs u. Laurahütte.....	2,410,439	1,675,405	65.3
4. Hohenlohe'sche.....	1,696,755	1,215,524	71.6
5. Schaffgott'sche.....	1,680,500	1,325,070	78.8
6. Fürstlich Donnersmarck'sche.....	1,304,053	940,202	72.1
7. Ballestrem'sche.....	1,203,981	742,740	61.7
8. Schlesische A. G. ....	1,058,183	648,841	61.2
9. Donnersmarckhütte.....	1,048,504	729,803	69.5
10. Grafen Donnersmarck'sche.....	1,016,764	577,220	56.8
11. Borsig'sche.....	907,448	440,589	48.5
12. Pless'sche.....	338,353	248,729	73.4
13. Emmagrube.....	257,493	160,392	62.2
14. Oberschl. Eisenbahn Bedarf A. G. ....	197,723	-----	-----
15. Trautscholdseggengrube.....	32,586	55,223	171.9
Total.....	18,239,543	12,415,934	Av. 68.6

Regularity in the occupation of the mines, according to their allotted participation, is a fundamental principle in the management of the Ruhr syndicate which controls, of course, the distribution of orders.<sup>1</sup> This is demanded for the most economical production as well as for a fair distribution of the business. In order to equalize any deficiencies which may unavoidably occur, the treaty provides that mines which fill more than their share of orders shall pay a fixed contribution per ton of excess into the treasury of the syndicate; while those that fill less than their share shall receive a compensation of equal amount per ton of deficiency. The amount of this contribution (or compensation) was fixed originally at 0.50 m. per ton, but in 1901, it was changed to 1.00 m. per ton.<sup>2</sup>

<sup>1</sup> Kirdorf, *Cent. Verband D. I.*, 1901, p. 35.

<sup>2</sup> Raffalovich, p. 17. In 1898 the excess production exceeded the deficiencies, so that only 16.42 per cent. of the contributions were exacted, since they sufficed to cover the deficiencies. In 1899 and 1900 neither contribution nor compensation was paid, because all the mines received all the orders they could fill. In 1901 and 1902, on the other hand, the full sum was collected and paid in each case. *Kartell-Rundschau*, 1903, pp. 101-2.



Some general economic questions remain to be considered respecting the productive features of the coal industry: first, the influence of the consolidation of mines, second, the economies effected by the cartells, and, third, the general effect of cartells on productive efficiency.

Both from the mercantile and technological aspects, it has been long recognized that there were considerable economies possible in the consolidation of mines. In the first category, it is evident that there are opportunities for saving in the salaries of administrative officers and salesmen, in better prices on large purchases of supplies and in the greater credit and power of large capital in various business relations. In the second category, without going into detail, it is evident that there are opportunities for economy in motive power, in the reduction of the number of shafts necessary for production and ventilation, in the disposition of the labor force at the points most needed—especially in the better opportunities to carry on development work or make repairs without discontinuing or interrupting production. Practical experience has tested the benefits of consolidations, and they have increased in favor.<sup>1</sup>

In consequence of these facts, in spite of an enormous increase in production, there has been a large decrease in the number of mines in Germany in the last thirty years.<sup>2</sup>

	<i>Number of Mines.</i>	<i>Annual Out- put, Tons.</i>
1871-5 .....	629 .....	34,485,400
1882 .....	492 .....	52,118,600
1892 .....	423 .....	71,372,200
1900 .....	338 .....	109,290,200

<sup>1</sup> *Bochum Hk.*, 1886, p. 9; 1898, p. 42.

<sup>2</sup> *Stat. Jahrb. D. R.*, 1902, p. 30. Steinmann-Bucher, Wesen, etc., p. 134. The movement in Braunkohlen is similar; thus there were 627 plants in 1891 as compared with 569 in 1900.

The figures for Prussia and for the Ruhr show, of course, the same movement.<sup>1</sup>

<i>Prussia</i>	
1862 -----	434
1872 -----	476
1887 -----	357
1902 -----	270
<i>Ruhr</i>	
1874 -----	245
1889 -----	168
1902 -----	164

The following table shows the extent of administrative and technical consolidation in the Ruhr; that is the number of concerns and the number of mines classed according to output.<sup>2</sup>

<i>Output.</i> <i>1000 tons.</i>	<i>Concerns.</i>	<i>Mines.</i>
0 -----	9 -----	10
Under 50 -----	13 -----	13
50-100 -----	5 -----	6
100-200 -----	22 -----	32
200-500 -----	26 -----	58
500-1000 -----	23 -----	35
1000-2000 -----	10 -----	7
2000-3000 -----	1 -----	0
3000-4000 -----	1 -----	0
4000-5000 -----	1 -----	0
Over 5000 -----	1 -----	0
Not given -----	5 -----	5
Total -----	117	166

That the consolidation of adjacent mines for purposes of operation is of great advantage in the economy of production is shown by the larger output *per capita* for the large mines. Taking 148 mines of the Ruhr, for which the figures of production and the number on the pay roll is given for 1902, we have the following results :

<sup>1</sup> *B.-H. u. S.*, 1903, I, p. 34 ; Oldenburg, p. 277.

<sup>2</sup> Compiled from Steinkohlenzechen. Of ten mines reported as having no output, 5 were in process of construction, 1 being deepened, 4 shut down, which in one case was due to insolvency.

<sup>1</sup> Output.	Number of Mines.	Output per capita.
Under 50,000 tons -----	10 -----	193.9
50,000-100,000 -----	5 -----	209.2
100,000-200,000 -----	32 -----	200.4
200,000-300,000 -----	29 -----	226.8
300,000-500,000 -----	30 -----	236.8
500,000-1,000,000 -----	35 -----	256.7
1,000,000-2,000,000 -----	7 -----	279.3

The same facts shown in the last two tables are found in Upper Silesia.<sup>2</sup>

Output.	Concerns.	Mines.	Output per capita.
Under 50,000 -----	2 -----	16 -----	104
50,000-100,000 -----	0 -----	8 -----	258
100,000-200,000 -----	5 -----	8 -----	249
200,000-300,000 -----	2 -----	6 -----	231
300,000-500,000 -----	2 -----	5 -----	297
500,000-1,000,000 -----	1 -----	13 -----	335
Over 1,000,000 -----	11 -----	7 -----	346

There does not seem to be any evidence that the syndicate has had the effect of promoting consolidation,<sup>3</sup> except in a very secondary sense, as for example to acquire an increase in participation. On the whole it has tended to retard the normal movement towards consolidation. The Harpener consolidations occurred chiefly before the formation of the syndicate. The syndicate, by giving to each member an assured existence, removes cut-throat competition and the destruction of the weaker and poorer mines.

What the consolidation of single mines accomplishes in the way of administrative and technical economy finds its counterpart in the establishment of the cartell for a whole district. This is true especially of the

<sup>1</sup> Compiled from Steinkohlenzechen, 1903. One mine is omitted from the first class because of an abnormally low production.

<sup>2</sup> Compiled from *Statistik, Oberschles. B.-u. H.*, 1902, pp. 2-8; Enquete, pp. 555-6. Each member of the convention is taken as separate concern.

<sup>3</sup> Cf. however, Kirdorf, *Cent. Verband D. I.*, 1901, p. 227.

mercantile side. Technical economies, through consolidation, find their limits in location of the mines, but the syndicate in its administrative and mercantile functions is capable of an almost indefinite extension and has the advantages connected therewith in unitary management and consolidated power. Great savings are possible in the conduct of sale through economies in agencies and advertisements and in price-cutting. It also facilitates a better distribution of orders with respect to the nearest source of supply, saving time and money on shipments. These facts are commonplaces of cartell policy, but it is impossible to measure them quantitatively.<sup>1</sup> Absolute consolidation, in most cases, would probably be even more effective in these directions.

Examining now the other side of the shield, we have to inquire whether there are any disadvantages in production in the cartell *régime*. It is a favorite indictment of the opponents of cartells that they tend to retard economic progress,<sup>2</sup> to petrify the industrial organization, and, in particular, to maintain in existence concerns that under competitive conditions would be unable to survive. The advocates of the cartells, on the other hand, generally deny these charges; but in some cases they have admitted them in part, and justified the cartells from the standpoint of "middle-class policy" in preserving a great number of small independent enterprises even though all of them are not the most economical or most progressive.<sup>3</sup> However laudable the wish to maintain these numerous "existences" may be from the humanitarian or social stand-

<sup>1</sup> Some writers doubt their importance. Cf. Vogelstein, p. 67.

<sup>2</sup> Cf. Phillipovich, I, p. 187.

<sup>3</sup> Cf. Sarter, p. 22; Enquete, p. 752.

point, their artificial sustentation at the expense of the consumer and to the detriment of the most efficient production must be in itself a most serious disadvantage.

The Ruhr syndicate is undoubtedly guilty, to a certain extent, of supporting this policy, but it would probably be an exaggeration to take it as a serious abuse. The evidence that such a condition exists in some measure is seen in the fact that used-up mines are purchased and shut down by concerns which wish to obtain their participation.<sup>1</sup> Liefmann thinks, indeed, that this process is better than the "selection" of free competition,<sup>2</sup> because the vendors of the exhausted mine do not suffer a total capital loss. The question, however, has nothing to do with the position of the sellers, who should have prepared for the final exhaustion of the mine by proper depreciation and reserve accounts.<sup>3</sup> The real test of the question is that of socially advantageous production. If a worthless mine commands a price, it must be due to a monopoly value in the right to participate in the syndicate sales, and this payment for the right to participate is made on the assumption that the prices, fixed by the cartell, make it valuable. Who pays in the end? There are two probable assumptions in theory; first, that the marginal cost of production is prevented from diminishing by the purchase under consideration, in which case it presumably comes out of the consumer; that is, a tax is levied on consumption for the benefit of the sellers

<sup>1</sup> See case of Concordia and Steingatt, mentioned above, p. 127. Cf. also, Nordstern and Helene, Mt. Cenis and Bommerbänker Tiefbau; Enquete, p. 151; Liefmann, *Unternehmervverbände*, p. 171.

<sup>2</sup> "Auf diese Art erfolgt der notwendige Ausleseprozess, sogar in noch vorteilhafterer Form als im Zustand der freien Konkurrenz." Liefmann, *Unternehmervverbände*, p. 171.

<sup>3</sup> Cf. Pohle, p. 122.

of the mine, the injurious effects of which to the consumer probably far outweigh the benefits to the sellers. Second, the purchasing mine may be so productive that the said purchase does not prevent the mine from continuing to produce below the margin of cost. In this case the direct concern of the public in the transaction is limited to the existence of a monopoly in general, and whether an unreasonable price scale exists in respect to the actual margin of cost. Serious danger from this cause exists only where such rights are acquired by mines of low productivity.<sup>1</sup>

The possible injurious effects from this policy are prevented from becoming serious through what may be called the heavy dilution of the original rights of participation; that is, the great increases in the total of the participation figure. The relative importance of the poorer mines, which cannot show the technical basis for a claim to increase in participation is thereby greatly diminished.

The mining industry of Germany, whether cartelled or not, cannot be justly accused of being behindhand in technical development—the Ruhr district least of all.<sup>2</sup> The profits of the mines depend on their keeping down the cost of the production, for which they are alone responsible, and this in general is a sufficient guarantee of technical efficiency. Another thing that tends to keep the competitive spirit alive among them is that, so far as practicable, coal is sold by the brand (*i. e.*, particular companies or mines) so that they are directly concerned in maintaining a good quality.

Probably under a competitive system the incentive in this last direction would be greater, and, indeed, in

<sup>1</sup> Cf. Liefmann, p. 272.

<sup>2</sup> Except, perhaps, in "machine mining."

recent years there have been some complaints respecting quality for which the cartells have been blamed,<sup>1</sup> but others assert that the quality has improved.<sup>2</sup> In times of great haste in production, as in the coal famine year, 1900, it is natural that less attention should be paid to quality. The wilful adulteration of coal with dirt, slate, *etc.*, sometimes practiced by dealers, has nothing to do with the cartells.<sup>3</sup> Complaints of inferior quality are found with respect to the output of the fiscal Saar.<sup>4</sup>

<sup>1</sup> Enquete, pp. 267-70, 374 ; X Commission, p. 7 ; Huber, pp. 125-6.

<sup>2</sup> Enquete, pp. 202, 269.

<sup>3</sup> As in Upper Silesia in 1900, by an irregular coal trade developed during the famine. Cf. *supra*, p. 507 ; X Commission, pp. 51 *et seq.*

<sup>4</sup> *Saarbrücken Hk.*, 1899, p. 7 ; 1900, p. 7.

## CHAPTER II

### COST OF PRODUCTION OF COAL

The cost of production is the indispensable basis for the criticism of price policy. In the cost of production of coal, there have been considerable changes in the course of the last half century. Since the end of the seventies, at least in the Ruhr, there has been an almost uninterrupted increase. With the progress of the mechanic arts, and the increase in the quantity of coal produced, the technical methods have been enormously improved both in power and refinement. The deep mining, which is predominant today in the Ruhr, requires a higher technique than the simple slope and tunnel mining with natural drainage and ventilation. A modern coal mine, to be in a position to work profitably, requires a very elaborate equipment above ground for conveying, pumping, ventilating, signalling *etc.*, including the investment of millions for steam and electrical machinery and housing for the same. Once the coal is brought to the surface an elaborate plant is required to sort and refine it. If, further, the company goes into the manufacture of coke and briquets, this means a large additional plant.<sup>1</sup>

<sup>1</sup>The importance of these items may be gathered from the following table of the book values of Dannenbaum, June 30, 1900, a mine of medium size, but well equipped.

Total value of mine and plant, 19,627,756 marks, of which :

Mining fields.....	4,951,377 marks.
Land (surface) .....	877,723 "
Mining construction.....	3,239,653 "
Surface buildings .....	1,979,951 "
Machinery .....	3,345,103 "
Railway .....	542,520 "
Inventory.....	1,478,885 "
Coke ovens (ordinary) .....	798,866 "
Coke ovens (by-product) .....	365,869 "
Benzol plant.....	112,500 "
Waterworks .....	151,596 "
Ventilation shaft .....	1,053,872 "

*Dortmunder Jahrb.*, 1901, p. 31.



In general the change in technique has been caused, first, by the greater difficulties of deeper mining, second, by the superiority of mechanical over hand labor, and, thirdly, by the elaboration of the process and products. In some cases the change in technique stands for an increasing, in others for a diminishing cost. For example, where elaborate mechanical ventilation is required, in place of natural ventilation, the change in technique corresponds to an increased cost, so, again, where elaborate pumping systems displace natural drainage or simple methods. Sometimes there has been a contest, figuratively speaking, between the increasing difficulties of mining and the technical methods of overcoming them. Other changes in technique, however, correspond to diminishing costs—especially the substitution of mechanical, chemical and electrical agencies for human agencies. Such a change, for example, is marked by the introduction of explosives and drills instead of the pick, of steam or electricity in place of hand power or horses for cars under ground, of electrical elevators and aerial trams for cruder methods of conveyance. The elaborate washing systems for separating the coal correspond to an attempt to improve the product and to increase its value, as well as to cheapen the methods of sorting, while the plants for the by-products of coke manufacture, gas, tar, benzol, ammonium sulphate, *etc.*, correspond to new products and reductions in the cost of production of coke. In general, then, we may say that the increased investment in plant, *etc.*, due to the technical development, may stand for either increasing or decreasing costs in mining; generally what is above ground represents the latter, and what is below ground

stands for decreasing costs, also, except where it is the consequence of deeper mining, excessive water, and the like.<sup>1</sup>

Another very important factor in the estimate of cost is the difficulty or ease of mining, depending on the thickness, frequency and inclination of the seams, the character of the roof and floor, *etc.*, that is, the degree of richness of the mine. The differential returns in coal mining are of a surprising degree of variation. Taken in connection with depth, this is the critical factor of productivity and cost. For example, in the Ruhr district, of two mines, Dorstfeld and Ewald, not greatly unequal in size, the average output per capita per shift in the period 1893-99 (inclusive)—a period of steady production—was for the former .743 tons and for the latter 1.134 tons (a difference of over 52% compared with the former). As these average figures are approximate to the annual figures, the presumption is strong that they represent normal differences in productivity due to differences in the richness of deposits,

<sup>1</sup> Oldenburg, writing in 1890, explains the fall in price as due to decreasing costs following technical improvements (p. 286), and Kleine, writing in 1894, explains the increase in the per capita output of miners on the same ground (Kleine, *Ztg. Oberschl. B.-u. H. Ver.*, 1894, p. 10). The figures are striking; the per capita output for the Ruhr was:

1850.....	139 tons.
1860.....	154 "
1870.....	225 "
1880.....	280 "
1890.....	315 "

etc.<sup>1</sup> The differences between the productivity in particular mines in the same region is not generally greater than the differences between the natural productivity of different mining regions.<sup>2</sup>

PRODUCTION IN TONS PER CAPITA PER SHIFT.

Year.	Ruhr.	Upper Silesia.	Saar.
1890	.935	1.233	.767
1891	.906	1.178	.756
1892	.895	1.110	.744
1893	.900	1.183	.780
1894	.900	1.216	.772
1895	.898	1.255	.792
1896	.908	1.284	.808
1897	.897	1.310	.819
1898	.873	1.357	.819
1899	.865	1.356	.805
1900	.851	1.293	.795
1901	.821	1.165	.759
1902	.828	1.118	.766

The superiority of the Upper Silesian district over the Ruhr in respect to the richness and accessibility of deposits is striking, and still more so its advantage over the Saar. These we shall see below correspond to differences in general average cost. In the Ruhr we

<sup>1</sup> To show these facts more in detail the following table has been compiled comprising all the larger mines for which these data are presented in the *Dortmunder Jahrbuch*:

	1893.	1894.	1895.	1896.	1897.	1898.	1899.	Av.	Output in 1000 tons. 1893 — 1899
Dannenbaum	0.890	0.828	0.819	0.834	0.810	0.748	0.759	0.812	308—345
Consolidation	1.057	1.099	1.096	1.089	1.082	1.080	1.084	1.084	1050—1433
Dorstfeld	0.710	0.770	0.690	0.754	0.769	0.765	0.741	0.743	316—434
Ewald	1.141	1.045	1.043	1.200	1.172	1.199	1.141	1.134	387—722
Graf Bismarck	1.040	1.130	1.160	1.140	1.080	1.010	1.020	1.083	694—1085
Harpener	0.908	0.858	0.872	0.930	0.896	0.887	0.872	0.889	2930—4976
Magdeburg	0.965	0.985	1.049	1.050	1.004	1.024	1.060	1.019	423—510
Massen	0.860	0.888	0.914	0.877	0.819	0.829	0.866	0.865	249—534
Mt. Ceniz	—	0.842	0.829	0.831	0.891	0.950	0.976	0.887	208—571
Pluto	0.845	0.801	0.826	0.808	0.894	0.806	0.811	0.827	623—898
Average	0.919	0.920	0.931	0.952	0.942	0.930	0.933	0.933	

<sup>2</sup> *B.-H. u. S.*, 1903, p. 43.

seem to have distinct evidence of decreasing returns, due to the increasing difficulties of mining. Possibly Upper Silesia has reached that point also. The mines of the Saar, which have been worked at considerable depth for a much longer period, show a much greater constancy in returns.

Another very important element of cost is wages. Wages seem to have borne a fairly constant proportion to the total cost, the declining importance of labor power being offset by the increase in the rate of wages. According to Effertz's calculations, which cover a considerable majority of the production of the Ruhr district, the proportion of wages to the total cost was <sup>1</sup> in

1878	-----	55.628%
1885	-----	59.129%
1894	-----	57.433%

Wages have advanced decidedly in the last fifteen years in all the mining districts, although the rate varies considerably between districts, and corresponds in some measure to differences in cost.<sup>2</sup>

AVERAGE WAGES PER SHIFT IN MARKS PER TON.

	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	0001	1001
Upper Silesia . . . . .	1.85	2.03	2.37	2.46	2.43	2.42	2.45	2.46	2.49	2.58	2.73	2.87	3.12	3.10
Lower Silesia . . . . .	2.04	2.23	2.45	2.50	2.46	2.42	2.40	2.43	2.49	2.59	2.67	2.80	3.00	2.92
Dortmund . . . . .	2.69	3.05	3.49	3.54	3.28	3.14	3.16	3.18	3.29	3.57	3.74	3.96	4.18	4.07
Saar . . . . .	2.92	3.24	3.79	3.89	3.69	3.37	3.24	3.27	3.28	3.34	3.40	3.46	3.56	3.54

One reason for the lower wages in Upper Silesia is the richness of the mines which require a less proportion of miners to the total number of persons employed.<sup>3</sup>

Materials, relatively to wages, are an unimportant element of cost, but still the prices of wood and iron

<sup>1</sup> Effertz (1895), p. 9.

<sup>2</sup> *B.-H. u. S.*, 1902, p. I.

<sup>3</sup> *Statistik, Oberschl. B.-u. H.*, 1902, Vorwort.

make a considerable difference. The rise of the prices of these and other commodities used in mining have contributed to increase the costs of production in the later nineties.<sup>1</sup>

The variations in the rate of interest do not seem to have affected the mining industry unfavorably in the period we have under consideration. Loans secured by mortgage formerly were made at  $4\frac{1}{2}\%$ , as a rule, but, during the last decade, they have been converted to a large extent to a 4% basis.<sup>2</sup> In this connection we may observe also a few points in regard to the policy of the mining companies in writing off depreciation and the establishment of reserves. The coal industry (as all mining industries) must take account of the fact that the material mined is taken from the ground once for all, and at the end of the term of exploitation nothing remains to the owners but machinery of relatively little value and a hole in the ground. For the period from 1873 to 1890, Effertz gives a calculation which shows that the average annual amount entered for depreciation was only about 1.6% of the share capital, or 1.36% of the total invested capital. Effertz thinks that 3% would be a fair amount,<sup>3</sup> which is certainly an excessively moderate estimate. The recent amounts have been much higher.<sup>4</sup>

Finally, among the component elements of cost, we

<sup>1</sup> *Oppeln Hk.*, 1900, p. 17; Enquete, p. 482. According to the *Zeitung d. oberschl. B.-u. H. Vereins*, 1901, p. 377, the cost of wood amounts to 65 to 80 pf. per ton; it is stated that the prices of wood have risen 10-15%. This would give an increase of cost per ton for coal of a mean of 9 pf.

<sup>2</sup> Cf. *Dortmunder Jahrbuch*, 1901, *passim*.

<sup>3</sup> Effertz (1891), pp. 11-12.

<sup>4</sup> Cf. Pt. IV., ch. vii.

may consider what are called in Germany "social burdens," which include not only taxation in the ordinary sense, but also compulsory contributions for workingmen's insurance, *etc.* The relative importance of these burdens in 1892-3 in the Ruhr are given by Effertz as follows: mining tax, 23%; "Knappschaft" contribution, 24%; accident insurance, 16%; old-age and sickness insurance, 10%; taxes, 26%; various other contributions, 1%. The first item in this list, namely, the mining tax (which was 2% on profits) ceased to be collected after 1894. On the other hand the local taxes are not included in the list, and the insurance burdens increased in weight in the following years.<sup>1</sup> Taking, however, the contributions stated above, Effertz finds that they formed the following element in the cost of coal mining.<sup>2</sup>

	% total cost.	Cost per ton.
1878 -----	4.700 -----	0.232 m.
1885 -----	4.952 -----	0.238 "
1894 -----	8.740 -----	0.557 "

These expenses have increased in recent years, taking the total of such burdens. Thus the accounts of the Harpener, one of the greatest and most prosperous mining companies in Germany, show that expenditures for such purposes in 1900-1 were 3,600,014.01 m.; the total expenditure was 37,114,557.99 m., so that they formed about 10% of the total cost. The total production was 4,921,170 tons (1901) which makes these contributions

<sup>1</sup> Effertz (1895), pp. 6-8.

<sup>2</sup> *Id.* (1895), p. 9.

about 0.73 m. per ton.<sup>1</sup> In much the same category as the compulsory payments for taxes and labor insurance, from the point of view of the cost of production, are the voluntary contributions to the benevolent institutions (Wohlfahrtseinrichtungen). The expenditures of Krupp in this direction (partly for coal miners) are well known.<sup>2</sup>

The question of the cost of production is critical for the proper estimation of the price policy pursued by the cartells, as well as other producers, but the subject, unfortunately, is not so free from uncertainty as could be desired. The proper analysis of value in relation to cost nowhere requires more complete data than in an industry like coal mining where (1) the costs of different mines vary widely, and (2) the costs undergo considerable variations from year to year. It would be quite insufficient to get the cost of production of an average mine for a normal year. That might do fairly well for some manufacturing industries, but it would be completely inadequate for mining. The official Prussian

<sup>1</sup> The details are as follows :

**Taxes :**

Mining tax to Herzog v. Arenberg-----	120,929.11 m.
State tax-----	121,500.00 "

**Communal taxes :**

Income -----	250,577.62	
Trade-----	204,907.19	
Land and Buildings -----	36,234.63	
	<hr/>	491,719.44 "

**Other contributions :**

Berggewerkschaftskasse -----	29,961.28 "
Accident Association -----	502,101.24 "
Handelskammer -----	4,267.99 "
Boiler Insurance Union-----	12,209.00 "
Gauging fees-----	699.32 "
Knappschaft and Labor Insurance -----	2,316,626.62 "

---

3,600,014.01 "

*Glückauf*, 1901, p. 1024.

<sup>2</sup> Cf. *Essen Hk.*, 1901, II, p. 20.

statistics contain, however, material for the determination of average costs for the Ruhr. These are found in the *Zeitschrift für das Berg-Hütten und Salinenwesen*. The facts are peculiar; under the title "Wert pro Tonne," averages are given for the different mining districts which except in the case of the Ruhr stand for average proceeds per ton.<sup>1</sup>

In the case of the Ruhr, they are estimated costs per ton, though this is not generally understood.<sup>2</sup> In addition to this material, and such occasional estimates as may be found in the literature of the industry, the present writer has compiled a table from material concerning the Dortmund district, which has apparently hitherto escaped the attention of economical writers, or at least remained unused, and which affords the proper sort of basis for the calculation of costs and the criticism of prices. For other districts than the Ruhr the material is wholly unsatisfactory,

From the statistical data concerning a large number of individual mines in the Ruhr contained in the *Dortmunder Jahrbuch* (1901) the following table of costs of production has been compiled. All the mines for which costs are given, except two or three mines accidentally omitted, are included in the table, which may be considered as quite representative of the district, especially for 1889-1899.

<sup>1</sup> Compare the statistics given there with the *Statistik d. Oberschl. B.-u. H.*

<sup>2</sup> Brefeld, minister of trade and industry, quotes them as statistics of price (see debate on the *Etat*, *Glückauf*, Feb. 1, 1900, Beilage, p. 4), and so does Calwer (see Calwer, 1900, p. 93). A hint, however, of their true significance may be found in Enquete, p. 50. The writer verified his deductions by enquiries made to the superintendent of one of the Ruhr mines.



## COST OF PRODUCTION PER TON IN MARKS.

MINE.	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Altendorf	--	--	--	--	--	--	--	--	--	--	3.73	4.59	6.75	7.67	6.77	7.63	7.80	9.95	12.23	8.96
Aplerbecker	--	--	--	--	--	--	--	--	--	--	5.31	6.14	7.07	7.02	7.15	7.00	7.05	7.00	7.25	7.14
Bickfeld	6.25	5.28	6.72	7.08	6.36	6.82	6.05	5.77	5.97	6.88	9.22	7.31	6.96	6.95	6.91	7.39	8.72	8.53	8.74	8.64
Blankenburg	3.75	3.90	3.63	4.20	3.67	3.62	3.82	4.06	4.09	4.84	5.96	6.23	5.02	4.68	4.86	4.88	5.33	6.68	7.08	6.65
Bonnerbänker	--	--	--	--	--	--	--	--	--	--	5.42	6.40	6.51	5.75	5.95	5.94	5.96	6.70	7.03	8.05
Caroline	5.55	6.74	6.83	6.36	6.32	5.98	5.87	6.15	6.55	6.94	7.02	7.36	6.82	6.39	6.29	7.05	7.42	6.91	7.36	8.03
Concordia	4.99	5.05	4.55	4.98	--	--	--	4.77	4.69	5.58	6.89	7.02	6.81	6.51	6.18	6.27	5.50	5.82	6.31	6.68
Dahlbusch	--	--	--	--	--	--	--	--	--	--	--	--	5.54	5.86	5.70	5.67	5.83	5.85	6.14	6.42
Dalhäuser	3.85	3.78	3.90	4.00	3.86	3.84	4.20	4.13	4.64	5.09	6.04	6.65	6.87	7.79	7.13	7.70	12.75	8.72	9.71	8.32
Dannenbaum	--	--	--	--	--	--	--	--	--	5.63	6.25	6.22	5.91	5.79	6.09	6.16	6.25	6.83	7.72	7.80
Deutschland	--	--	--	--	--	--	--	--	--	--	--	--	--	8.12	8.03	7.13	8.05	6.79	10.62	7.34
Dorstfeld	5.18	5.05	5.22	5.35	5.39	5.49	5.34	5.20	5.15	6.91	7.91	8.05	8.19	7.39	7.17	7.53	7.00	7.19	7.91	8.67
Dortmunder—	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Louise Tiefbau	--	--	--	--	--	--	--	--	--	--	--	--	--	5.65	5.31	5.58	5.79	6.71	7.17	7.17
Bruchstrasse	--	--	--	--	--	--	--	--	--	--	--	--	--	7.28	8.31	7.63	7.93	8.10	8.44	8.63
Eiberg	--	--	--	--	--	--	--	--	--	5.05	5.52	6.68	6.49	6.11	5.89	6.07	6.34	6.69	6.67	6.97
Eintracht	--	--	--	--	--	--	--	--	--	6.07	7.08	7.33	7.17	7.06	6.91	6.21	6.04	7.07	7.19	7.68
Ewald	--	--	--	--	5.88	5.61	5.37	4.55	5.30	5.99	6.25	6.39	6.28	6.02	6.25	5.90	5.26	5.80	5.67	6.93
Frei Vogel u. Unverhofft	--	--	--	--	--	--	--	--	--	6.05	7.50	7.41	6.68	6.55	6.56	6.79	6.85	7.06	7.56	8.40
Friedricher Nachbar	4.90	5.03	5.23	5.33	4.94	4.63	4.38	4.54	4.66	6.93	7.92	8.65	7.23	6.21	7.45	6.78	6.43	8.16	9.65	11.14
Friedrich d. Grosse	--	--	--	--	--	--	--	--	--	6.05	7.15	7.44	7.02	6.81	7.15	7.40	7.37	7.07	7.35	8.48
Gen. Blumenthal	--	--	--	--	--	--	--	--	--	--	7.82	8.20	7.61	6.94	6.87	6.35	6.69	7.19	6.93	7.26
Gelsenkirchen—	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rhein Elbe u. Alma	--	--	--	--	--	--	--	--	--	4.81	5.73	6.23	5.94	5.84	5.96	5.96	5.96	5.82	5.94	6.32
Stein	--	--	--	--	--	--	--	--	--	3.64	4.63	6.27	5.74	5.33	5.54	5.51	5.58	6.02	6.12	6.50
Hardenberg	--	--	--	--	--	--	--	--	--	5.73	6.37	6.27	5.74	5.33	5.54	5.51	5.58	6.02	6.12	6.50
Erin	--	--	--	--	--	--	--	--	--	4.36	5.95	6.20	5.94	5.38	5.25	5.12	5.17	5.21	5.52	5.68
Hansa	--	--	--	--	--	--	--	--	--	7.07	7.00	6.17	5.77	5.50	5.55	5.95	6.68	7.34	7.04	7.12
Zollern	--	--	--	--	--	--	--	--	--	4.78	6.44	6.49	5.81	5.70	5.83	5.71	5.48	6.41	7.76	8.02
Germania	--	--	--	--	--	--	--	--	--	4.78	5.67	5.91	5.89	5.48	5.37	5.20	5.25	5.91	6.37	6.79
Monopol	--	--	--	--	--	--	--	--	--	5.47	6.82	6.62	6.25	5.81	5.84	5.60	5.37	5.83	6.59	7.29
Bonifacius	--	--	--	--	--	--	--	--	--	5.10	6.02	6.34	6.44	6.83	6.45	6.05	5.91	6.97	7.41	8.20
Glückwinkelnburg	--	--	--	--	--	--	--	--	--	--	6.75	6.50	6.00	6.15	6.26	6.28	6.28	5.62	5.22	5.92
Graf Bismarck	6.48	4.99	5.29	6.09	4.93	4.67	4.69	4.65	4.72	5.40	6.01	6.09	5.92	5.93	5.85	5.51	5.67	6.26	6.61	6.84
Graf Schwerin	--	--	--	--	--	--	--	--	--	6.33	7.29	7.09	6.64	6.63	6.65	6.64	6.86	7.54	7.34	7.65

MINE.	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Harpener (15 mines)-----																				
Heinrich-----	5.06	5.69	4.60	5.76	5.34	4.44	5.79	5.07	5.94	5.27	5.74	5.29	6.42	6.19	5.70	5.80	5.74	6.08	6.49	7.33
Johann Delmeberg-----																				
Julius Philipp-----	4.51	4.22	4.60	5.32	4.84	4.53	4.38	3.87	4.44	5.61	6.06	7.36	6.10	6.40	5.97	6.09	6.37	7.56	7.56	7.74
Kölnier Bgrwerk-----	3.84	3.82	3.99	3.89	4.06	4.02	4.07	4.01	4.03	4.70	5.68	5.69	5.83	5.48	5.50	5.24	4.94	5.14	7.38	8.55
König Ludwig-----																				
Langenbrahm-----																				
General-----																				
Magdeburg-----																				
Mark-----																				
Massen-----																				
Mt. Ceniz-----																				
Mühlheimer-----																				
Humboldt-----																				
Wiesche-----																				
Nordstern-----																				
Grat Moltke-----																				
Paul-----																				
Preussische Clus-----																				
Prinz Friedrich-----																				
Rheinische Anthracit-----																				
Centrum-----	3.83	3.68	4.31	4.95	4.14	3.78	3.56	3.85	4.24	5.35	5.43	5.22	5.03	4.94	4.99	4.92	4.65	5.01	5.97	5.96
Richardt-----																				
Pluto-----	4.63	4.79	4.99	5.00	4.75	5.00	4.81	4.28	4.86	6.12	6.98	6.84	7.14	6.59	6.38	6.99	7.14	7.22	7.12	8.18
Schürbank u. Char.-----	5.52	5.06	4.78	4.34	4.15	4.55	4.91	4.28	4.62	5.50	6.70	6.81	6.77	6.50	6.80	6.47	6.55	6.52	7.25	7.67
Steingatt-----																				
Stock u. Scherenberg-----																				
Trappe-----																				
Tremonia-----																				
Unser Fritz-----																				
Wiendalsbank-----																				
Average-----	4.84	4.79	4.95	5.03	4.88	4.72	4.69	4.45	4.96	5.78	6.79	6.80	6.61	6.39	6.37	6.38	6.63	7.04	7.18	7.58

The preceding table includes mines having about 50% of the total output of the Dortmund district, and gives a fairly reliable showing of the cost of production. A comparison of the averages with the returns from the *Zeitschrift f. d. Berg-Hütten u. Salinenwesen* show conclusively that the latter are figures of cost. To these we add various occasional estimates, of which those of Effertz, based on elaborate calculations, are specially valuable.

AVERAGE COST PER TON IN THE DORTMUND DISTRICT.

YEAR.	Table, pp. 154-5	B.-H. u. S.	Misc.	YEAR.	Table, pp. 154-5	B.-H. u. S.	Misc.
1878---	----	4.60	4.94 <sup>1</sup>	1891---	6.80	8.38	-----
1879---	----	4.20	-----	1892---	6.61	7.38	7.25 <sup>2</sup>
1880---	4.84	4.58	-----	1893---	6.39	6.42	-----
1881---	4.79	4.58	-----	1894---	6.37	6.38	6.38 <sup>3</sup>
1882---	4.95	4.60	-----	1895---	6.38	6.66	-----
1883---	5.03	4.76	-----	1896---	6.63	6.77	-----
1884---	4.88	4.76	-----	1897---	7.04	7.04	-----
1885---	4.72	4.70	4.81 <sup>1</sup>	1898---	7.18	7.32	-----
1886---	4.69	4.69	-----	1899---	7.58	7.66	-----
1887---	4.45	4.64	-----	1900---	-----	8.54	-----
1888---	4.96	4.80	-----	1901---	-----	8.77	8.20 <sup>4</sup>
1889---	5.78	5.47	-----	1902---	-----	8.39	-----
1890---	6.79	7.98	6.50 <sup>3</sup>	-----	-----	-----	-----

The average cost of production furnishes only an approximate measure for the criticism of price policy, because in a commodity like coal, produced under conditions of differential costs, an adequate price must be reckoned, not from the basis of average cost, but from the basis of the cost of that part of the necessary supply produced at the greatest disadvantage. In the case of coal produced under a cartell *régime*, such as that of the

<sup>1</sup> Effertz (1895), p. 8-9. For 1878 he reckons on a basis of 59.60% of the output; for 1885, on 65.96%, and for 1894, on 79.63%.

<sup>2</sup> Kanitz, p. 9.

<sup>3</sup> Kleine, *Zeitung Oberschl. B.-u. H.*, 1894, p. 11.

<sup>4</sup> Grassmann, *Stahl u. Eisen*, 1902, p. 846.

Ruhr, some modifications appear necessary to this general statement; that is to say, in so far as the cartell has kept concerns going, which under competition would be driven out of the business, and whose portion of the supply could be furnished by the richer mines at less expense, it does not seem proper to take their costs as the margin of the cost of production. In other words the proper margin of cost of production is not to be found in the unusually expensive ones. It must be remembered, also, that even very good mines may show from time to time abnormally high costs of production, due to accidents, labor troubles, cessation of mining to do development work, *etc.* Here, also, the true margin of cost is not to be found in the cases of abnormally expensive production. Just where to draw the line is a very difficult question, but some exercise of reasonable judgment gives a better standard than would be otherwise obtained. At any rate some idea may be formed of the margin of cost. For this purpose the production of the mines given on pp. 154-5, for the years 1894 and 1899, may be tabulated according to cost of production, as follows: <sup>1</sup>

Cost. m.	1894		1899	
	Production Tons	Per ct.	Production Tons	Per ct.
Under 5.00 -----	270,127	1.3	-----	-----
5.00-5.50 -----	11,227,183	6.2	760,885	2.8
5.50-6.00 -----	10,218,046	51.6	1,616,755	6.1
6.00-6.50 -----	3,786,573	19.2	2,318,485	8.7
6.50-7.00 -----	2,635,499	13.3	6,199,168	23.4
7.00-7.50 -----	1,202,160	6.0	7,492,031	28.2
7.50-8.00 -----	290,417	1.5	2,685,945	10.1
8.00-8.50 -----	139,728	0.7	3,588,404	13.5
8.50-9.00 -----	-----	-----	1,477,807	5.6
Over 9.00 -----	-----	-----	417,680	1.6
	19,769,733		26,557,160	

<sup>1</sup> Production compiled from statistics of individual mines in *B.-H. u. S.*, 1894 and 1899.

According to the data given in the above table, 0.7% of the tonnage was produced in 1894 at a cost of from 8.00 to 8.50 m. per ton. It would, evidently, be absurd to take 8.50 m. as the margin of cost, but how much to cut off is largely a matter of opinion or guess work. Let us assume 15% as a fair estimate. Calculating as near to this as possible from the detailed statistics of production for these mines, we find that a deduction of 14.7% of the output would give for the remainder a margin of cost of 6.65 m. If to this we add 0.60 m. for pure interest (4% on an assumed capital of 15 m. per ton),<sup>1</sup> we have 7.25 m. as a theoretical margin of cost. Calculating the margin for 1899 in the same way, we find that by the exclusion of 13.2% of the total production (the nearest obtainable to 15%) we get a maximum cost at 8.18 m., and, adding an interest charge of 0.60 m., we have a total marginal cost of 8.78 m. If these calculations should be taken as approximately correct, we would have standards for *fair prices* for 1894 and 1899 respectively at 7.25 m. and 8.78 m.<sup>2</sup> These calculations, however, rest on too many suppositions to make it worth while to carry them out in detail for each year. So that in general we shall have to be satisfied with the theoretically much more imperfect standard of average cost.<sup>3</sup>

No adequate statistical material is available for estimating the cost of production in Upper Silesia. Sympher makes an estimate in 1899 that the cost of pro-

<sup>1</sup> See Pt. IV., ch. vii.

<sup>2</sup> The proceeds per ton of the syndicate for those two years is reported at 7.83 m. and 9.14 m. respectively. Enquete, p. 279.

<sup>3</sup> An analysis of the data presented by Effertz in his *brochures* for 1894 and 1895 (taken together) according to the theory worked out above, gives remarkably close results for 1894. It seems that if 10% of the total production embraced in his calculations is excluded (in order to reach the marginal cost), we would arrive at 7.61 m. as a result.

duction is about 5.30 marks.<sup>1</sup> There is probably less variation on the whole than in the Ruhr, as the region is very rich and not much developed. That the cost of production has been low is shown by the figures for the fiscal mines.<sup>2</sup>

	<i>König.</i> <i>m.</i>	<i>Königin Luise.</i> <i>m.</i>	<i>Average.</i> <i>m.</i>
1888-89	3 087	3 340	3 214
1889-90	3 522	3 799	3 661
1890-91	4 473	5 103	4 788
1891-92	4 740	5 564	5 520
1892-93	4 911	5 300	5 106
1893-94	4 484	4 672	4 578

In recent years the costs have considerably increased, due, according to Williger, to greater depth and more water.<sup>3</sup> Voltz gives some particulars which throw a little light on the situation. It seems that the costs in the fiscal mines increased by 1.60 between 1895 and 1903, and that in the case of two private concerns the costs increased 1.89 and 1.96 m. respectively. Voltz places the present cost in the fiscal mines at nearly 6.00 m.<sup>4</sup>

The cost of production in the Saar has been higher generally than either in Upper Silesia or the Ruhr, though there is surprisingly little increase in the last few years, compared with the other regions. According to Laur, the cost per ton in the period 1883-1901 was as follows : <sup>5</sup>

<i>m.</i>	<i>m.</i>
1883-84 ----- 5.73	1892-93 ----- 8 03
1884-85 ----- 5 75	1893-94 ----- 7 29
1885-86 ----- 5.58	1894-95 ----- 7 13
1886-87 ----- 5.61	1895-96 ----- 6 94
1887-88 ----- 5.43	1896-97 ----- 6.85
1888-89 ----- 5.46	1897-98 ----- 6.87
1889-90 ----- 6.70	1898-99 ----- 7 14
1890-91 ----- 7.98	1899-1900 ----- 7 51
1891-92 ----- 8 39	1900-01 ----- 7 51

<sup>1</sup> Sympher, p. 132.

<sup>2</sup> Renauld, p. 53.

<sup>3</sup> Enquete, p. 482.

<sup>4</sup> *Id.*, pp. 493-4, (1902).

<sup>5</sup> Laur, II, p. 130.

## CHAPTER III

### PRODUCTION AND COST OF PRODUCTION OF COKE

The production of metallurgical coke in the various regions of the German Empire from 1891 to 1902 is shown in the following table.<sup>1</sup>

DISTRICT.	PRODUCTION OF COKE (1000 TONS.)											
	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902
Ruhr District . . .	4388	4561	4780	5399	5563	6265	6872	7374	8202	9644	8778	8969
Upper Silesia . . .	1118	1060	1060	1121	1114	1269	1399	1348	1399	1411	1257	1172
Lower Silesia . . .	293	325	366	416	427	443	424	430	460	536	514	470
Saar District . . .	584	587	574	695	713	744	821	887	923	894	838	928
Aachen District . .	266	259	219	207	287	310	337	338	353	367	360	372
Obernkirchen . . .	25	26	27	24	27	27	30	30	31	31	31	43
Kingdom Saxony . .	82	82	73	79	70	77	77	72	74	74	63	58
German Empire . .	6712	6899	7099	7941	8201	9135	9960	10479	11442	12957	11841	12012

It is evident, from an inspection of the above table, that most of the coke is produced in the Ruhr; in 1902 it comprised 74.66% of the total for the Empire. The development of coke production on a large scale is comparatively recent; the production of the Ruhr in 1850 was only 73,112 t., and in 1870 only 341,033<sup>1</sup> tons.

Of the Ruhr production, 76.6% is in the hands of the coke syndicate which produces nearly three fifths (57.2%) of the whole output of the Empire. In the second largest field,—Upper Silesia—coke was only very recently cartelled;<sup>2</sup> there is no cartell in Lower Silesia.<sup>4</sup> In the Saar the production is mainly in private hands.<sup>5</sup> The only other noteworthy district

<sup>1</sup> *Dortmunder Jahrb.*, 1901, p. 581, (for 1891-3); *Jahresbericht des Vereins*, Dortmund, 1902, p. 9, (for 1894-1902) The statistics of production given here are for coke plants at the mines, and do not include gas-coke. See *Stahl u. Eisen*, 1898, p. 641.

<sup>2</sup> Bericht d. Cokssyndicat, 1900, Anhang.

<sup>3</sup> *Kartell-Rundschau*, July 12, 1903, p. 149.

<sup>4</sup> *Industrie Ztg.*, 1902, p. 182.

<sup>5</sup> For 1901 the chief Saar producers, besides the fiscus, were Enkel de Wendel, 110,000 tons; Gebruder Stumm, 163,866 tons; Luxemburg Bgw., 194,236 tons; Röchling'sche Eisen u. Stahlw., 192,296 tons; this gives a total of 660,398 tons. *Saarbrücken Hk.*, 1901, II, p. 3.

is Aachen, and its production is cartelled with that of the Ruhr.<sup>1</sup> The production of the coke syndicate and its relative importance in the Ruhr district and Empire are shown in the following table.<sup>2</sup>

Year,	Production Coke Synd. Tons.	Per ct. of Ruhr.	Per ct. of Emp.	Year.	Production Coke Synd. Tons.	Per ct. of Ruhr.	Pr. ct. of Emp.
1891	3,937,733	89.7	58.7	1897	6,036,530	87.8	61.1
1892	4,025,053	88.3	58.3	1898	6,415,683	86.9	61.1
1893	4,196,917	87.8	59.1	1899	7,045,923	85.9	61.5
1894	4,736,195	87.7	59.6	1900	7,786,826	80.7	60.1
1895	5,040,092	86.7	58.7	1901	6,833,567	77.8	57.7
1896	5,574,695	88.9	61.0	1902	6,873,162	76.6	57.2

The significance and power of the coke syndicate is measured more nearly by its relation to the production of the Ruhr district, than to the whole Empire. Over the industrial markets of the west, it holds undisputed sway. An examination of its proportion of the Ruhr output shows a very marked decline between 1891 and 1902, namely, 13.1%, but, as in the case of the coal syndicate, the real meaning of this change is understood only when we consider the outsiders who produce this tonnage. Strictly speaking, there are three groups of producers in the Ruhr besides the syndicate; first, those works that are allied to the syndicate and whose production is included in the above table;<sup>3</sup> second, the outsiders proper, and third, the coke works independently operated by blast furnaces and other consumers. Their relative importance is shown in the following table:<sup>4</sup>

<sup>1</sup> Cf. Rept. of coke syndicate, in *Bochum Hk.*, 1894, p. 11.

<sup>2</sup> *Dortmunder Jahrbuch*, 1901, p. 554; Bericht d. Cokssyndicat. Certain private works allied to the syndicate are included in these figures.

<sup>3</sup> Five works, apparently, producing about 328,000 tons. *Steinkohlenzechen*, p. 103.

<sup>4</sup> *Dortmunder Jahrbuch*, 1901, p. 554. Reports of coke syndicate.



Yr.	SYNDICATE.		OUTSIDERS.	BLAST FURNACES.		Total Output, tons
	Output, tons	Per ct.	Output, tons	Output, tons	Per ct.	
1891	3,937,773	89.7	62,160	388,077	8.8	4,388,010
1892	4,025,053	88.3	142,350	393,581	8.6	4,560,984
1893	4,196,917	87.8	141,574	441,998	8.2	4,780,489
1894	4,736,195	87.7	119,052	543,365	10.1	5,398,612
1895	5,040,092	88.8	82,233	540,178	9.7	5,562,503
1896	5,574,695	88.9	158,680	531,963	8.5	6,265,338
1897	6,036,530	87.8	191,693	653,777	9.5	6,872,000
1898	6,415,683	86.9	163,154	795,483	10.8	7,374,320
1899	7,045,923	85.9	218,332	937,367	11.4	8,201,622
1900	7,786,347	80.7	392,300	1,465,510	15.2	9,644,157
1901	6,833,567	77.8	488,455	1,456,185	16.6	8,778,207
1902	6,873,162	76.6	330,830	1,765,461	19.7	8,969,453

From this table it appears, that the syndicate has lost ground considerably in the general production, but, as it has lost it to the blast-furnace works, which consume most of the coke they make, it does not have such an important influence on the market as it otherwise would.<sup>1</sup>

Another fact that tends to strengthen the syndicate is that with a number of the so-called Hüttenzechen arrangements have been made whereby they place the sale of their surplus product in the hands of the cartell.<sup>2</sup> The syndicate sells, therefore, more coke than it produces. In 1895 it sold in all 5,514,830 tons, of which 141,640 tons were for the Aachen district, 40,416 tons for allied coke works, 5,122 tons for blast furnaces, and 505,860 tons for the Belgian syndicate.<sup>3</sup>

For its policy in regulating the output, the coke syndicate has come in for much more blame than the coal syndicate. An inspection of the table of production shows that there was a great increase in the output,

<sup>1</sup> Some of the blast-furnace works own cokeries which belong to the syndicate, viz., Carolinenglück (Bochumer Verein), Dannenbaum (Deutsche-Luxemburgische A. G.), Pluto (Schalker), and Westphalia (Hoesch). Steinkohlenzechen, pp. 102-4.

<sup>2</sup> Steinkohlenzechen, p. 104.

<sup>3</sup> Report of coke syndicate for 1895, in *Bochum Hk.*, 1895, p. 9.

during the first decade of its existence, from 3,937,773 tons in 1891, to 7,786,347 tons in 1900, an increase of 97.7%. This covered the period of *hochconjunctur*. In the two following years (1901-1902) there was a distinct decline, coinciding with the crisis. All this was according to the approved methods and principles of cartell management, and the question is whether there was enough coke to supply the demand in both periods. The demand for coke is almost entirely industrial. Thus in 1902, about ten elevenths of the coke produced was large coke (gross coks), which is used for blast furnaces (79.78%) and foundries.<sup>1</sup> A less recent, but more instructive statement of coke consumption is found in the following table for the coke syndicate for 1890:<sup>2</sup>

	<i>Consumption.</i>	<i>% Gross Coks.</i>
Blast furnace .....	2,773,560 tons.	76.47
Steel mills .....	64,660 "	1.78
Foundries, smelters .....	611,074 "	16.85
Railways .....	35,600 "	0.98
Sugar factories .....	16,900 "	0.47
Cement factories .....	18,750 "	0.52
Export (over sea & Italian) .....	106,250 "	2.93
Large coke .....	3,626,794 "	100.00
Broken coke .....	131,506 "	
Small coke .....	87,590 "	
	<hr/> 219,096 "	

Leaving out export, the first three uses constitute about 95% of the whole consumption; that is, coke consumption is practically measured by the demand of the iron industry. In order, therefore, to measure the relation of the supply and demand for coke we must compare the inland consumption and iron production.

This is shown for the Zollverein in the following table:

<sup>1</sup> Calculated from *Berichte d. Cokesyndicat, 1900-1902*.

<sup>2</sup> *J.-B. Dortmunder Verein, 1890, p. 23.*

YEAR.	Coke** production 1000 tons.	Coke* imports 1000 tons.	Coke* exports 1000 tons.	Domestic consump't'n of coke 1000 tons.	Iron‡ production 1000 tons.	Ratio of coke con- sumption to iron production.
1891 --	6712	319	1354	5677	4641	1.22
1892 --	6899	466	1718	5643	4937	1.13
1893 --	7099	439	1902	5636	4986	1.13
1894 --	7941	404	2262	6083	5380	1.13
1895 --	8201	462	2293	6370	5465	1.17
1896 --	9135	394	2216	7313	6373	1.15
1897 --	9960	435	2162	8233	6881	1.19
1898 --	10479	333	2133	8679	7313	1.19
1899 --	11442	463	2138	9767	8142	1.19
1900 --	12957	513	2229	11233	8423	1.33
1901 --	11841	401†	2097†	10145	7785	1.30
1902 --	12012	362†	2181†	10193	8402†	1.21

\* *Dortmunder Jahrbuch*, 1901, p. 581; ‡ *Stahl. u. Eisen*, 1902, p. 341;

\*\* *Dortmunder Jahrbuch*, 1901, p. 581, *J.-B. d. Vereins*, Dortmund, 1902, p. 9; † Bericht d. Cokessyndicat, 1902; ‡ *Auswärtige Handel d. D. Zollgebiets*, 1902, II.

The column of ratios shows an almost steadily increasing supply of coke as compared with the demand in iron production for the *hausse* period, and the decline in 1902 marks rather a return to conditions of normal supply, as compared with the excessive purchases at the time of the two year fusion contract.

In accommodating the supply to the demand, two problems are presented: first, measurement of the production, secondly, measurement of the consumption. The difficulties which confront the coal producers in determining their capacity and in producing according to their plans necessarily confront the coke producers also in getting their supplies of coking-coal. On the other hand, in the process of coke manufacture itself, the calculations as to production are relatively simple and certain.<sup>1</sup> The only complication worth noticing in this connection is that arising from the use of various kinds of ovens. There are two chief sorts, *i. e.* the by-product ovens and the ordinary or "normal" ovens.

<sup>1</sup> Cf. Report of coke syndicate, in *Bochum Hk.*, 1898, p. 49.

Of the former, six grades may be distinguished with capacities ranging from 900 to 1400 tons, and of the latter, five grades varying from 700 to 1000 tons.<sup>1</sup>

If regularity of production is important for the economical production of coal, it is still more so for coke, because an irregular employment involves great expense, through the cooling of the ovens, and, in the case of by-product ovens, the work must necessarily be prosecuted day and night in a continuous action in order to get the proper mixture of gases, *etc.*<sup>2</sup>

Any judgment of the success of the coke producers in controlling the output must take account of the needs of the producers as well as the needs of the consumers. With these difficulties to contend with, it is not surprising that the accommodation of supply to demand is not always perfect. Thus, in 1898-99, the coke producers found themselves unable to meet all demands,<sup>3</sup> while the sudden change of *conjunctur* in 1900 made coke a drug in the market in the following year, and blast-furnaces producing coke for their own use made the confusion worse by trying to sell unused quantities.<sup>4</sup> Where the coke had been contracted for in advance, the consumers who no longer needed it were given some relief by postponements of delivery, which added to the uncertainty of the problem, presumably, for the producers.<sup>5</sup> It was the desire of the coke producers to get a steady basis for production, as well as the wish to make sure of the favorable prices prevailing

<sup>1</sup> Enquete, p. 618.

<sup>2</sup> *Id.*, pp. 635, 747.

<sup>3</sup> *Id.*, p. 638; *Oppeln Hk.*, 1898, p. 6.

<sup>4</sup> *Supra*, 1901, p. 7.

<sup>5</sup> Enquete, pp. 661, 682.

during the *hochconjunctur*, that led to the formation of the widely condemned two year contracts.

The method adopted by the coke syndicate for the regulation of the output is similar to that of the coal syndicate. There is an estimate of the maximum technical capacity of the ovens, which is made the basis for the participation figures, and these are increased with the development of the plants, provided the situation of the market permits it. No coke plant may claim an allowance beyond what it can actually produce.<sup>1</sup> The allowances for production are controlled, further, by a calculated contraction which is intended to make the supply equal to the demand. The ordinary ovens are better adapted to such changes than the by-product ovens, and it is said that this is one reason for their continued use in large numbers.<sup>2</sup>

The production has generally been below the participation figures, being subjected as a rule to a contraction by the cartell. In some periods, however, when the demand exceeded the theoretical technical capacity, it was found impossible to equal the participation figures, although all restrictions on production were removed. Sometime this was due wholly or partly to external causes, as in 1898, when there was a scarcity of coking-coal.<sup>3</sup> In 1899, fires and other disturbances of production kept some ovens behind, so that, in spite of the fact that other ovens were producing in excess of their quotas, the total production was 1.8% behind the

<sup>1</sup> Enquete, p. 617.

<sup>2</sup> Cf. *Id.*, p. 747. Of the 8907 ovens in operation in 1902, about one-third (2803) were equipped for by-products. Bericht d. Cokesyndicat, 1902.

<sup>3</sup> Report of coke syndicate, in *Bochum Hk.*, 1898.

participation figures.<sup>1</sup> On the other hand, for the month of October 1894, the production exceeded the participation 1.75%.<sup>2</sup> Complete data as to the projected and actual contraction are lacking, but the following table shows the general policy and practice of the syndicate.<sup>3</sup>

Year.	Projected contraction.	Actual contraction.	Yr.	Projected contraction.	Actual contraction.
1891 --	8% (last 5 mo.)	----	1897	----	----
1892 --	18.75	13	1898	----	{ 7.65 first half.
1893 --	23.5	14.6	1899	o	1.8
1894 --	6.7	5	1900	o	o
1895 --	----	{ Jan. Nov. Dec. o rest of year, 4-19	1901	23.16	21.35
1896 --	----	6.17	1902	31.8	23.93

For the participation figures fuller though not complete data are available.<sup>4</sup>

Year.	Participation Figures.	Year.	Participation Figures.
1891-----	3,863,672 <sup>a</sup> tons.	1897-----	<sup>a</sup> 5,733,990 tons.
1892-----	4,626,500 "	1898-----	Jan. 1, 6,238,682 "
1893-----	4,914,400 "	1899-----	" 6,924,936 "
1894-----	4,985,500 "	1900-----	" 7,094,434 "
1895-----	-----	1901-----	{ " 8,030,044 "
1896-----	5,941,300 "	1902-----	{ Dec. 31, 8,578,144 "
			" 8,647,194 "

The increase shown here between 1891 and 1902 amounts to over 124%. According to the contraction figures, as presented above, the consumers do not seem to have had much ground for complaint on the score that the plants were restricted in their output. The wild

<sup>1</sup> Bericht d. Cokssyndicat, 1899.

<sup>2</sup> Report of coke syndicate, in *Bochum Hk.*, 1894, p. 11.

<sup>3</sup> 1891-8, *Id.*, 1898-1902, Berichte d. Cokssyndicat; 1897, *Ztg. d. Oberschl. B.-u. H.*, 1897, p. 302.

<sup>4</sup> Reports of coke syndicate, and calculations therefrom.

<sup>5</sup> Enquete, p. 619; <sup>a</sup> *Ztg. Oberschl. B.-u. H.*, 1897, p. 202.

demand for coke came in 1899 and 1900, and at that time there was practically no limitation, while in 1901-2, when a heavy contraction was imposed, many concerns were complaining of being obliged to take the amounts they had contracted for, and were very glad when the syndicate would consent to postpone delivery. But it may well be asked whether the syndicate did not prevent the establishment of new plants to such a degree as to make the coke famine in 1899-1900 a possibility. If the syndicate failed in this respect, it would seem to be an error that could be neither foreseen nor proved afterwards to have been committed. If we compare the production of blast furnace coke of the coke syndicate sold in the domestic market with the iron production of the Zollverein, the coke supply available for inland consumption shows a marked relative increase up to 1901, though it falls off in the last two years<sup>1</sup>

There are very great differences in the amount of coke produced by different concerns, but this fact has not the same significance as for coal production. They are grouped as follows:<sup>2</sup>

Over 1,000,000 tons.....	2 concerns.
300,000-500,000.....	5 "
200,000-300,000.....	5 "
100,000-200,000.....	14 "
50,000-100,000.....	13 "
Under 50,000 .....	5 "
<hr/>	
Total production = 8,647,194 .....	44 concerns.

With a few unimportant exceptions, (outside of the syndicate) the coke works are attached to the coal mines, and large coal mines, such as Harpener or Gelsenkirchen, naturally have a large coke production.

<sup>1</sup> Enquete, p. 620, and Bericht d. Cokesyndicat, 1900, Appendix.

<sup>2</sup> Enquete, p. 791.

Of course to make coke at all the mine must produce the right sort of coal. There does not seem to be any great advantage in developing production on a large scale from the technical standpoint, and it is a fact that the large concerns operate their coke works at the various locations of their mines. Thus there are forty-four members in the syndicate, but there are ninety-nine distinct plants.<sup>1</sup> The utility of the syndicate, from the point of view of economy of production, lies apparently in the administration of sale and the saving of freight charges. It is noteworthy that only the first was urged on the coke producers in Bergassessor Pieper's memoir in 1887, and that principally from the expected advantages in price-making.<sup>2</sup>

The purchase of coal mines, and the coke works belonging to them, by blast furnaces has for its main object the acquisition of a supply of coke. This proceeding has been made more desirable since the coal and coke syndicates began to put up prices, but they have only accelerated a movement which began long before.<sup>3</sup>

In respect to the quality of the coke under the syndicate *régime*, many complaints have been made,<sup>4</sup> chiefly in the years of extraordinary demand when the natural tendency would be towards some deterioration in quality.<sup>5</sup> The production of a good coke depends, first of all, on having the right sort of coal; obviously when the demand is very great, inferior sorts may be used, as better than none, while the fact that the syndicate re-

<sup>1</sup> Enquete, p. 718.

<sup>2</sup> Denkschrift über den Alleinverkauf von Koks, *etc.*, 1887, reprinted in Enquete, p. 773, Anlage 4.

<sup>3</sup> *Id.*, p. 753.

<sup>4</sup> *Id.*, pp. 710 *et seq.*; Wieser, p. 316.

<sup>5</sup> Enquete, pp. 717, 720.



fuses to guarantee quality opens the door to considerable abuses.<sup>1</sup> A quantitative measurement of the degree of deterioration was presented by Generaldirektor Bertram-Brückhöfe at the Enquete. According to exact analyses, Bertram found that the coke supplied at his works (about 300-400 tons daily) contained the following percentages of ashes and water.<sup>2</sup>

Year.	Analyses.	Year.	Analyses.
1886-----	14.90	1898-----	19.10
1887-----	12.81	1899-----	18.96
1888-----	15.64	1900-----	21.43
1889-----	15.49	1901-----	18.94
1890-----	21.46	1902-----	17.00
Average 16.06		Average 19.09	

The effect of this additional degree of impurity during the second period as compared with the first (excluding the exceptional years 1890 and 1900) Bertram calculates at 2.29 m. per ton on a price basis of 19 m. per ton.<sup>3</sup> The editors of *Stahl und Eisen* summed up the situation as follows:—"individual exceptions only verify the general picture that for the consumer the character of the Westphalian coke shows a most sensible deterioration."<sup>4</sup>

<sup>1</sup> Especially noteworthy is the arraignment of the coke syndicate by Kirdorf-Rote Erde (brother of the coal magnate), chairman of the Halbezeug-Verband. Cf. Enquete, pp. 725-8.

<sup>2</sup> *Id.*, p. 715.

<sup>3</sup> *Id.*, pp. 715-16. Another series of analyses of Ruhr coke, covering the period 1893-1900, shows the same result.

Year.	Ashes.	Water.	Total.
1893-----	8.76	4.76	13.52
1894-----	8.99	5.98	14.97
1895-----	9.45	5.99	15.44
1896-----	9.91	6.60	16.51
1897-----	9.95	8.32	18.27
1898-----	10.00	8.77	18.77
1899-----	10.05	8.62	18.67
1900-----	10.00	10.10	20.10

See *Stahl u. Eisen*, 1901, p. 291; see also p. 213.

<sup>4</sup> *Id.*, 1901, p. 293.

The cost of production of coke presents quite a different problem from the cost of coal. In the first place, the cost of coke depends chiefly on the cost of coal, and must rise and fall, generally speaking, in proportion with it. Leaving the cost of coal out of account, the manufacture of coke seems to be an industry of something like constant returns. But the addition of the manufacture of by-products greatly complicates the problem of the determination of cost. Most of the coke in the Ruhr is produced in ordinary ovens, which produce, it seems, about two-thirds of the coke.<sup>1</sup> A ton of Ruhr coal gives about 70 per cent. of the same weight of coke; hence we must multiply the coal price by 1.43 to get the cost of the coal in one ton of coke. In addition to this expense, there are the costs of plant, labor and other materials than coal, besides general expenses. We may note first a few general estimates of cost. Graf Kanitz cites the statement of a technical expert in 1886 that the cost of production in the Ruhr was .60 m. for running costs and .80 m. for capital charges.<sup>2</sup> Since then the costs of labor and materials have risen considerably, but the technique has improved. Bergwerksdirektor Kleine reckons the cost of production in the Ruhr in 1894 (apart from the cost of coal) at 1.50 m.<sup>3</sup> For the Saar the following detailed official table shows the cost of producing coke in 1888-89.<sup>4</sup> These, again, are simply costs of operation.

<sup>1</sup> According to the Report of the coke syndicate for 1902 there are 8,907 ovens, of which 2,803 are equipped for by-products. There seems to be a great disparity between these official figures and those given by the Referent in the Enquete. See p. 618.

<sup>2</sup> Kanitz, p. 11.

<sup>3</sup> *Ztg. Oberschles. B.-u. H.*, 1894, p. 11.

<sup>4</sup> *B.-H. u. S.*, 1890, p. 129.

A. Wages,	
Superintendence .....	2.92
Transportation of coal .....	20.40
Operation of ovens .....	41.18
Withdrawal and separation .....	6.76
Quenching .....	19.27
Repairs .....	14.57
B. Materials .....	16.03
C. Other costs (incl. Knappschaft) .....	5.48
Total .....	126.61 pf.

Wages constitute over 90 per cent. The annual reports of Harpener, for 1900-1902, give an average cost of making coke (not including coal) at 1.15 m. per ton.<sup>1</sup> The considerable advance in the cost of operation in the Ruhr is undoubtedly due to the advance in wages, which for ordinary above-ground labor rose from 2.37 m. per man per shift in 1888 to 3.32 m. in 1900.<sup>2</sup>

Assuming, now, that the cost of coking coal is equal to the average cost of coal, and that the operating expenses are 1.15 m. per ton, we may make the following tentative estimate of the cost of coke (excluding interest).<sup>3</sup>

Year.	Average cost of coal. M.	Calculated cost of coke. M.	Year.	Average cost of coal. M.	Calculated cost of coke. M.
1887 .....	4.64	7.73	1895 .....	6.66	10.55
1888 .....	4.80	7.95	1896 .....	6.77	10.77
1889 .....	5.47	8.91	1897 .....	7.04	11.16
1890 .....	7.98	12.50	1898 .....	7.32	11.55
1891 .....	8.38	13.07	1899 .....	7.66	12.04
1892 .....	7.38	11.64	1900 .....	8.54	13.30
1893 .....	6.42	10.27	1901 .....	8.77	13.63
1894 .....	6.38	10.21	1902 .....	8.39	13.15

The results, thus obtained, are astonishingly and at

<sup>1</sup> *Glückauf*, 1901, p. 1024; *Frankfurter Ztg.*, Oct. 14, 1903.

<sup>2</sup> *B.-H. u. S.*, 1903, pp. 40-1.

<sup>3</sup> Cost of coal taken from figures of B.-H. u. S. on p. 156; cost of coke reckoned on basis of 70% production, with a cost of operation of 1.15 m.

least for all but the most recent years impossibly high, and show in the most conclusive manner that we cannot take the average cost of coal in calculating the cost of coke, as a matter of practical business. Coking-coal has always figured as a by-product in the coal business, at least until recent years, and has been sold customarily much below the average price of coal, and even below the average cost, just as a number of other grades of small coal are sold to-day. At what price it should be put in estimating the cost of coke is an arbitrary matter, and this, too, just as much if it is placed *above* as below the line of average cost. The enormous demand of recent years has tended to bring it from the category of an inferior sort to one of the more valued sorts of coal.

The relation of the production of the by-products of coke may be gotten approximately from the following data of weekly output.<sup>1</sup>

<i>Ordinary Theerofen.</i>	<i>Otto'schen Koksofen.</i>
1200 tons coke .....	1450 tons coke
30 " tar .....	66 " tar
10 " sulphate .....	24 " sulphate
4 " benzol .....	12 " benzol

The prices per ton in 1898 were as follows: tar, 20, sulphate 160 and benzol 270 marks.<sup>2</sup> Blast-furnace coke was 14.00 m.<sup>3</sup> Taking the Otto ovens, we have a total weekly product of 28,700 marks, which figured per ton output of coke gives 19.70 m. We have estimated a cost of production, with a basis of coal cost at 7.04 m. per ton, (if anything too high) at 11.57 m. This, of course, does not include the extra

<sup>1</sup> *Stahl u. Eisen*, 1898, p. 648.

<sup>2</sup> *Ib.*

<sup>3</sup> *Essen Hk.*, 1902, I p. 71.

expenses of getting the sulphate and benzol, but, on the other hand, it does not take account of the saving in fuel in the by-product oven, which is currently estimated as worth 2.31 m. per ton of coke,<sup>1</sup> and probably more than offsets the extra costs. It seems unlikely, therefore, that the cost would be as much as two-thirds of the value of the products. Another calculation, ready-made, which practically confirms the results we have obtained in the case above, is given by *Stahl und Eisen* as follows:<sup>2</sup> Assuming a cost of coal at the oven of seven marks per ton, and a weekly output of 840 tons of coke, then,

	<i>Beehive oven.</i>		<i>Coppée ordinary.</i>		<i>Coppée by-prod.</i>	
	s.	d.	s.	d.	s.	d.
The coal necessary for 1 ton coke costs	11	3	9	8	9	4
Labor for 1 ton coke costs .....	1	0	0	10	0	10
Cost per ton coke .....	12	3	10	6	10	2
Subtract net value of by-products .....	----	----	----	----	{ from 2 6 to 3 0	
“ saving in coal from gas heating-- .....	----	----	----	----	{ from 0 10 to 1 0	
Net cost per ton coke .....	12	3	10	6	{ from 6 10 to 6 2	

It should be observed that the by-product oven in this estimate gets much more coke per ton of coal than the beehive, and costs less to operate, to say nothing of the extra profits from the by-products. By a coincidence, the price we had to take for coal in the first calculation, *viz.* 7.04 m. is almost exactly the same as in this last calculation. Assuming the same price for coke in the market, we would have in this last case a net profit approximating say, 6-7 m. as before.

<sup>1</sup> *Stahl u. Eisen*, 1898, p. 648.

<sup>2</sup> *Id.*, 1899, p. 648; prices given as in original.

## CHAPTER IV

### PRICE POLICY

For the producer, the vital question is profits, for the consumer, prices. In general the interest of society is, that the former should be secured in a degree sufficient to stimulate enterprise, but it is very important that this should be accomplished through low costs rather than through high prices. The principal indictment against the cartells, as against all combinations, is that they are too apt to choose the latter method. Most cartells aim at price control either directly or indirectly *e.g.* by limitation of output, but that is not necessarily reprehensible, that is, it may be made necessary by cut-throat competition. On the other hand, it is easy for a cartell which possesses a monopoly to use its power to get "monopoly profits" through high prices. The coal and coke syndicates and the convention are price cartells. This applies to practically the whole sale of the coal syndicates, and to about 78% of the cartelled production in the case of the convention.<sup>1</sup>

Before attempting to discuss price policy, a few words concerning the statistics of prices are necessary. In the first place, we should observe that a distinction must be made between prices and average proceeds, the former is a more general term and includes the latter. Generally, however, in speaking of prices, a more or less stable quantity is understood for which a specific commodity or sort of the same is expected to sell. There are several kinds of price schedules in the coal trade, the normal (*Richtpreise*), the syndicate (*Verrechnungspreise*), the exchange quotations (*Börsenpreise*) the

<sup>1</sup>Enquete p. 345; cf. p. 106.

actual price in a transaction, *etc.*, all of which must be used and distinguished in discussing price policy. These schedules are very extensive of course, since there is a great variety of commercial commodities included in the general terms coal, coke *etc.* These prices are averaged by the week, month and year. They give a means of following more or less intelligently and easily the trend of business. Even for a particular sort of coal, these price schedules include a good many averages of differences. The situation may be shown most clearly by reproducing a current market report from *Glückauf*, a technical journal for mining interests.

"Essen Börse. Official report of July 13, 1903 published by the stock exchange commission, coal, coke and briquets, price quotations of the syndicate in the superior mining district of Dortmund."

Sort.	Mine price per ton in marks.
<b>I. Gas u. Flammkohle.</b>	
(a) Gasförderkohle.....	11.00-12.50
(b) Gasflammförderkohle.....	9.75-10.75
(c) Flammförderkohle.....	9.00- 9.75
(d) Stückkohle.....	12.50-14.00
(e) Halbgesiebte.....	12.00-13.00
(f) Nusskohle, gew. Korn I } .....	12.50-13.25
"          "      II } .....	
"          "      III.....	11.00-11.75
"          "      IV.....	9.75-10.75
(g) Nussgruskohle 0-20/30 mm.....	6.50- 8.00
"          "      0-50/60 mm.....	8.00- 9.00
(h) Gruskohle.....	4.00- 6.75
<b>II. Fettkohle.</b>	
(a) Förderkohle.....	9.00- 9.75
(b) Bestmellierte Kohle.....	10.50-11.00
(c) Stückkohle.....	12.50-13.50
(d) Nusskohle gew. Korn I } .....	12.50-13.50
"          "      II } .....	
"          "      III.....	11.00-12.50
"          "      IV.....	9.75-10.75
(e) Koks-kohle.....	9.50-10.00

## III. Magere Kohle.

(a) Förderkohle .....	7.75- 8.75
(b) Förderkohle melierte.....	9.50-10.10
(c) Förderkohle, aufgesiebte je nach dem Stückgehalt	11.00-12.50
(d) Stückkohle .....	12.50-14.00
(e) Anthrazit Nuss Korn I .....	17.50-19.00
"      "      "      II.....	19.50-23.00
(f) Fördergrus.....	6.50- 7.50
(g) Gruskohle unter 10 mm.....	4.00- 5.50

## IV. Koks.

(a) Hochofenkoks .....	15.00
(b) Giesereikoks .....	16.00-17.00
(c) Brechkoks I u. II.....	17.00-18.00

## V. Briketts.

Briketts, je nach Qualität .....	10.50-13.50
----------------------------------	-------------

*Glückauf*, 18 July, 1903, p. 695.

These prices may continue unchanged for weeks or months, but there is room for some variation between the price limits, though these are intended primarily to cover differences in brand (*i. e.* mine).<sup>1</sup>

In spite of these variations in price for a particular sort, it is useful, and for statistical purposes necessary, to average them to get a general comparison. A knowledge, however, of the actual differences should be borne in mind, and ought to prevent a too wide-sweeping averaging of prices. Even to show the trend of prices, it is better to take some typical sorts, such as the run of the mine (Förderkohlen) of the different qualities. These give the best means of comparing the price movements for different years; but they do not tell much about the amounts paid for coal, because a great many varieties of higher and lower prices, and different quantities are sold. The Essen statistics of the prices of Gas-, Gasflamm-, Fett-, and Magerförderkohlen are frequently used and give a fair pic-

<sup>1</sup> On the Düsseldorf Börse for the same week a somewhat different list is given with slightly varying quotations; *e. g.*, Fettförder, 9.00-9.80 m. *Glückauf*, 1903, p. 695.



ture of the rise and fall of prices, but they tell nothing about proceeds. For the upper Silesian mines, it is commoner to compare prices for particular sizes. The advent of the cartells has tended to make prices more constant, especially for short periods and between different markets. The reason for this is simple enough—the prices are fixed by the syndicate and are not left to the “higgling of the market”. The syndicate in fixing these prices naturally proceeds on a definite scheme of prices, (normal or Richtpreise) close to the market list, at least where outside competition does not intervene. The normal prices are provided for most of the important varieties and are more stable than the actual prices. The normal prices show best the opinions and policy of the managers of the cartell.

Proceeds are the actual receipts from sales. The proceeds of the sale of a ton of Fettförderkohle is strictly the price of a ton of Fettförderkohle, but the average proceeds per ton for the sale of many tons of different sorts of coal do not have a very useful significance as a price measure. Even for the same sort of coal, the sum of the proceeds may include very different prices from a commercial standpoint, *e.g.* wholesale, retail, export, to insiders, to outsiders, to railways, to iron producers, to coke producers, *etc.* Knowledge of the proceeds, however, is even more important than knowledge of the prices, when we come to judge of the general question of the profitableness of the business and the reasonableness of prices. We may reduce the general proceeds to proceeds per ton, just as we reduce costs to costs per ton, for purposes of comparison. Costs per ton are more legitimate statistically and from a commercial point of view than proceeds per ton. Speak-

ing roughly one kind of coal costs as much as another. The different prices of coal do not correspond generally so much to different costs as to different qualities, and the production of the low priced article often costs more, as a matter of fact, than a high priced one. The actual cost of mining cannot be figured independently for a particular sort, except when it occurs alone in the mine, but generally a mine produces several sorts.<sup>1</sup>

Where a coal mine produces several sorts of coal, and where in the process of separation, various grades of refinement are procured, some sorts will sell far above the average cost, and others will go for less. Thus, in the market quotations given above, the fine gas coal (Gasgruskohle) sells for 4.00–6.75, and the same sort of hard coal (Magergruskohle) for 4.00–5.50,<sup>2</sup> prices which are unquestionably below the average cost of production, and below the cost of production generally speaking, of any coal produced in that region. Such prices are determined like railway rates for different classes of freight by experience as to what is most profitable under the complicated conditions of joint cost and what the market will stand. From a consideration of these facts, it will be evident that a judgment of the reasonableness or unreasonableness of the prices for a particular sort of coal is not an easy matter, even when all the details of the business are known.

<sup>1</sup> Rheinpreussen advertises the following sorts: "*Fett-Flamm-und Esskohlen*: Stückkohlen, gew. Fett-Nuss I 45/80, II 25/45, III 15/25, IV 8/15 m/m., gew. Koks-kohlen." Steinkohlenzechen, p. 44.

Consolidation advertises: "*Gas-und Gasflammkohlen*: Cannelkohlen, Gasförderkohlen, Gasflammförderkohlen, Stücke I und II, Nussgrusskohlen 0/35 mm. *Fettkohlen*: Förderkohlen, Bestmelierte, Stückkohlen, I, II und III, gew. Nuss I 45/75, II 25/45, III 15/25, IV 10/15 mm., gew. Koks-kohlen." *Ib.*, p. 62.

<sup>2</sup> *Glückauf*, July 18, 1903.

In examining the course of prices, it is not necessary that we should go back in general more than twenty years. A brief notice of a few previous facts will suffice. The striking points in the early price changes in the Ruhr, after the beginning of coal mining on a large scale, are shown in the following table of the average prices of "run of the mine" on the Essen Börse.<sup>1</sup> This

1856	-----	11.00 m.
1864	-----	6.00 "
1869	-----	6.40 "
1871	-----	10.00 "
1874	-----	15.80 "
1875	-----	7.80 "
1878	-----	5.00 "

period was before cartells had any significance. We observe a decline in price (which as a matter of fact was nearly continuous) from 11.00 m. in 1856 to 6.00 m. in 1864; this gradually increased, till in 1869 it was 6.40 m. and in 1870, 7.35 m. The war and the following speculative period forced the prices up rapidly till they attained the height of 15.80 m. in 1874 (far above anything in modern experience), and then sank in the following year to 7.80 m. and further in 1878 to 5.00 m. The table on the following page, of the Essen Börse prices, gives the data for the four standard qualities of "run of the mine" <sup>2</sup> (1883-1902).

The ten years before the organisation of the Ruhr syndicate were years of futile effort at combination, characterized in general by cut-throat competition. The prices were at a low point at the beginning of the period, and reached their deepest ebb in 1886-7. With the improvement of business, they rose in the second half of the decade, and, aided by fortuitous cir-

<sup>1</sup> *Bochum Hk.*, 1878, p. 2.

<sup>2</sup> *Essen Hk.*, 1902, I, p. 71.

	<i>Gas.</i> <i>M.</i>	<i>Gasflamm.</i> <i>M.</i>	<i>Fett.</i> <i>M.</i>	<i>Mager.</i> <i>M.</i>
1883	7.45	6.29	5.88	5.28
1884	7.34	6.64	5.22	4.74
1885	7.33	5.89	5.63	4.70
1886	7.19	5.85	5.60	4.90
1887	7.10	5.72	5.62	4.88
1888	7.52	6.32	6.04	5.30
1889	11.04	9.29	8.48	8.26
1890	14.58	12.36	10.72	11.00
1891	12.91	11.02	9.86	9.73
1892	11.75	9.75	8.50	7.75
1893	9.79	7.58	7.29	7.50
1894	10.50	8.70	8.00	7.50
1895	10.13	8.33	8.00	7.50
1896	10.17	8.03	8.25	7.67
1897	11.17	8.57	8.85	8.32
1898	11.46	8.84	9.08	8.59
1899	11.75	9.13	9.37	8.88
1900	12.75	10.00	10.25	9.50
1901	12.75	10.00	10.25	9.50
1902	12.00	9.72	9.60	8.75

cumstances, especially strikes, and a feverish demand, the prices were put up to about double what they were in the middle of the decade, though not as high as in 1874. At the time, some writers<sup>1</sup> attributed this advance to the recently organized local cartells, but this seems unwarranted. At any rate, prices fell in the following years, and in 1893, the first year of the syndicate, (the prices were made for most of the output in the year preceding), they were certainly at a moderate height.

We have recounted already with some detail the historical development of the syndicate of the Ruhr, but a brief *resumé* of its price policy will make the following criticism clearer. The normal prices (*Richtpreise*) give an outline of the formal policy. For a few typical sorts the development was as follows.<sup>1</sup>

<sup>1</sup> *E. g.* Kanitz, p. 16.

PRICES GIVEN IN MARKS.<sup>1</sup>

	1893-4	1894-5	1895-6	1896-7	1897-8	1898-9	'99-00	'00-01	1901-2	1902-3	1903-4
Fettförderkohlen	7.00	7.50	7.50	8.30	8.60	8.60	9.10	10.10	10.50 <sup>2</sup>	9.50 <sup>2</sup>	9.50 <sup>2</sup>
Fettfördersehmede					8.50 <sup>2</sup>	9.00 <sup>2</sup>					
Fett Nuss I.	10.50	11.00	11.00	11.00	11.00	11.00	11.50	12.75	12.00 <sup>2</sup>	12.75 <sup>2</sup>	12.50 <sup>2</sup>
Fett gew. Nuss I.					10.00 <sup>2</sup>	10.50 <sup>2</sup>			12.00 <sup>2</sup>	9.50 <sup>2</sup>	9.50 <sup>2</sup>
Kokakohlen	5.50	6.00	6.50	6.50	7.00	8.00	8.50	10.50	10.00 <sup>2</sup>	6.50 <sup>2</sup>	6.50 <sup>2</sup>
Ungew. Fettfeinkohlen					4.00 <sup>2</sup>	5.00 <sup>2</sup>			6.50 <sup>2</sup>	10.25 <sup>2</sup>	10.00 <sup>2</sup>
Gasflammförderkohlen	8.00	8.50	8.50	8.75	9.25	9.25	9.75	10.75	10.75 <sup>2</sup>	10.25 <sup>2</sup>	10.00 <sup>2</sup>
Gasflamm Nuss I.	11.00	12.00	12.00	11.00	11.00	11.00	11.50	12.75	12.50 <sup>2</sup>	12.75 <sup>2</sup>	12.50 <sup>2</sup>
Gew. Gasflamm Nuss I.					10.50 <sup>2</sup>	11.00 <sup>2</sup>			11.25 <sup>2</sup>	11.25 <sup>2</sup>	11.00 <sup>2</sup>
Generatorkohlen					9.50 <sup>2</sup>	9.75 <sup>2</sup>					

<sup>1</sup> Denkschrift, p. 21.<sup>2</sup> Enquete, p. 282.

A comparison of the normal prices of Fettförderkohle, or Gasflamm, with those of the Essen Börse shows a substantial similarity. The differences occur in favor of the actual buyer as well as against him. That such differences must appear in practical affairs has already been indicated. The situation is explained from the inside by Herr Kirdorf as follows :

"According to the normal prices, which are established by the Beirat, the Vorstand has to determine the selling prices which serve as the price basis for the business year for which the Beirat has established the normal prices. This price basis must be maintained unchanged for the business year ; the Vorstand may not and cannot change them according to its will, or require more according to the opportunity of the market ; but it must hold to the given price, and may depart from them only when the Beirat establishes another basis. That, nevertheless, individual variations occur in the course of the year can be easily explained, first, that in the determination of the prices of particular qualities and brands, which is very difficult, errors may occur which must be remedied. Then, also, it can very easily happen that there is an absolute necessity to raise a given brand, in spite of the fixed prices and within the limits of the same, because the equalization of participation is an absolute condition. Is a given brand too strongly demanded, and always called for, then nothing remains except that it be raised in price, so that one can sell the cheaper brands again. You can easily imagine, that with the great number of mines, with the variety which exists in the various brands, qualities and sorts, it is extraordinarily difficult, and demands a tedious labor to fix these prices. And I will not conceal the fact that many influences make themselves felt which all aim to set the prices as high as possible. The individual representatives of the mines go to the individual executive officials of the syndicate and seek to influence them. . . ."<sup>1</sup>

If we take the Essen prices from the beginning of the syndicate, we observe for the qualities tabulated advances of a maximum from two to three marks, or in percentages from 27 per cent. to 41 per cent. ; the prices for 1902, being only 17 to 32 per cent. higher than in 1893. Except in the case of coking-coal (which according to the table of normal prices rose 91 per cent.), the results for other sorts are not widely dif-

<sup>1</sup> *Cent. Verb. D. Indust.*, 1901, p. 233.

ferent. In fact, only for Siebgruskohlen does there seem to have been anything like the advance for coking-coal.

The statistics of prices for Upper Silesian coal are not so extensive as those of the Ruhr. The following tables will give a tolerably complete view of their course. The reasons for the lack of extensive price statistics of a public character seems to be, first, that there are fewer varieties of coal produced, and, second, that what does not go directly to metallurgical works in the district appears in trade almost entirely in the hands of certain large dealers.

UPPER SILESIA, AVERAGE MINE PRICE IN MARKS.

<i>Year.</i>	<i>Gaskohle<sup>1</sup> Stück.</i>	<i>Flammkohlen<sup>2</sup> Stück.</i>	<i>Klein.</i>
1883	6.2	—	—
1884	6.1	—	—
1885	5.9	—	—
1886	6.0	—	—
1887	5.9	—	—
1888	5.9	6.4	3.2
1889	7.0	7.3	4.4
1890	9.5	9.2	6.2
1891	9.2	9.0	6.0
1892	9.1	8.7	5.4
1893	9.0	8.6	5.6
1894	9.0	8.6	5.6
1895	9.0	8.6	5.6
1896	8.9	8.6	5.6
1897	8.7	8.8	5.8
1898	9.1	9.1	6.0
1899	9.8	9.8	6.7
1900	11.0	11.6	8.2
1901	11.8	11.6	8.4
1902	11.7	11.4	7.8
1903	—	11.4	7.8

It is noticeable that the rise in price in 1890 (which was the year of the formation of the convention) was.

<sup>1</sup> *Vierteljahrshefte*, 1903, I, p. 21.

<sup>2</sup> Furnished through courtesy of Emanuel Friedlaender & Co.

not followed by so much of a decline in the succeeding years as in other parts of Prussia. Another table covering this important transition period, including other coal prices, given by *Glückauf*, is as follows.

	Stück u. Würfel. M.	Erbs. M.	Klein. M.
Jan. 1889	5.50-6.50	3.40-4.50	3.00-4.00
Apr. 1889	6.00	4.00	3.50
Sept. 1889	7.50-9.00	5.50-6.50	4.00-6.50
Mar. 1890	9.00	7.50	6.00
Dec. 1890	8.50	7.00	6.00
Dec. 1891	8.50	6.75	5.60
Dec. 1892	8.00-8.50	6.50	5.00-5.50

Comparing again the general table of coal prices in Upper Silesia (p. 184), we find a relatively small decline, for the years 1896-7, was followed by an advance which culminated in 1901, almost as great as in the *hausse* of 1890. The price advances for the lowest grades of coal were much greater, and must be criticised from a different standpoint. A few years ago they were regarded as comparatively worthless, and were generally consigned to the dump-heap, today they have a considerable application in industry.<sup>2</sup> Some of these sorts therefore advanced as much as 300% in price, as may be seen in the following table.<sup>3</sup>

YEAR.	Paulus Staubkohle.		Rudaer Mischkohle.	
	Date.	Price. M.	Date.	Price. M.
1890	Jan. 1	1.30	Jan. 1	1.30
1890	Oct. 1	1.70	Apr. 1	1.80
1891	Oct. 1	1.80	Jan. 1	3.00
1892			July 1	2.80
1893	Oct. 1	1.70	Jan. 1	2.60
1895	Oct. 1	1.80	July 1	2.45
1897	Oct. 1	2.10	July 1	2.70
1898			July 1	2.80
1899	Jan. 1	2.60	July 1	3.20
1900	Jan. 1	3.00	July 1	4.00
1901	Jan. 1	3.90	July 1	4.40
1902			July 1	4.00

<sup>1</sup> *Glückauf*, 27 Oct., 1900, p. 98.

<sup>2</sup> *Enquete*, p. 478.

<sup>3</sup> *Enquete*, pp. 582-3.



The data for the cartell prices of the Upper Silesian convention are very meagre. We have already had occasion to note that the convention is a price cartell only in fixing a minimum price; it does not attempt to fix the actual price, much less does it manage the sale as the Ruhr syndicate does.<sup>1</sup> As a matter of fact these minimum prices have generally been considerably below the actual market prices. General-Direktor Williger the president of the convention states that for thirteen years the minimum price for the best sorts had been 37 pf. per Zentner, or 7.40 m. per ton. This was subsequently raised as follows:<sup>2</sup>

	1898	-----	stood at	7.40 m.
Spring	1898	-----	raised to	7.80 "
"	1899	-----	"	8.20 "
Autumn	1899	-----	"	8.60 "
Spring	1900	-----	"	9.60 "
Autumn	1900	-----	"	10.00 "
Since then reduced somewhat.				

The advance in the minimum price between 1898 and 1900 was 35.1 per cent.; the average annual price for gas coal rose 35.6 per cent. between 1897 and 1901. The minimum prices are frankly declared to be determined by market conditions, and not the cost of production.<sup>3</sup> Coking-coal experienced a considerable advance with the rest. It seems that the price for the fiscal mine, Königin Luise, in the first half of 1899 was 6.30 m., and for the first of January, 1900, 7.50 m.<sup>4</sup> This appears to have been the general price also which advanced by July, 1900, to 8.00 m.,<sup>5</sup> or about 26.9 per cent. in a year and a half. Heavy reductions were

<sup>1</sup> Enquete, p. 329.

<sup>2</sup> Enquete, p. 360 (calculated from data given.)

<sup>3</sup> Williger, Enquete, p. 349; cf. p. 329.

<sup>4</sup> *Oppeln Hk.*, 1899, p. 11.

<sup>5</sup> *Oppeln Hk.*, 1900, p. 19.

made in the two following years, and for the Königin Luise the price on July 1, 1901, stood at 7.50 m. and on January 1, 1902, at 6.50 m.<sup>1</sup> It has been claimed that the price reduction of metallurgical coal was retarded by the iron interests (which own mines and are identified with the convention) in order to prevent rival iron manufacturers from getting cheaper coal.<sup>2</sup>

The criticism of the policy of the fiscus is of great importance in the analysis of the coal industry. It is unfortunate from this standpoint, that greater openness and publicity have not been practiced heretofore in their commercial dealings.<sup>3</sup> For general purposes of comparison, however, the following table for two important sorts will be sufficient for the mines of the Saar.<sup>4</sup>

Year.	Fiscal Saar.		Year.	Fiscal Saar.	
	Flamm.	Fett.		Flamm.	Fett.
	M.	M.		M.	M.
1883 ----	7.8 ----	7.7	1893 ----	9.9 ----	8.5
1884 ----	8.2 ----	7.6	1894 ----	9.7 ----	8.2
1885 ----	7.9 ----	7.4	1895 ----	9.6 ----	8.3
1886 ----	7.9 ----	7.4	1896 ----	9.4 ----	8.4
1887 ----	7.6 ----	7.3	1897 ----	9.7 ----	8.8
1888 ----	7.5 ----	7.4	1898 ----	9.8 ----	9.0
1889 ----	8.1 ----	8.3	1899 ----	10.5 ----	9.7
1890 ----	10.7 ----	10.9	1900 ----	11.9 ----	11.4
1891 ----	10.4 ----	10.3	1901 ----	12.8 ----	12.5
1892 ----	10.4 ----	9.5	1902 ----	12.1 ----	11.5

A comparison of this table with the Essen quotations shows a range of prices averaging higher, though the advances of prices in the periods of *hochconjunktur* were not so great, before the syndicate was formed, but greater after. Thus the average price (for the period given) of Flamm was, for the fiscal Saar, 9.6 m. and for

<sup>1</sup> *Oppeln Hk.*, 1901, p. 66.

<sup>2</sup> Enquete, p. 469. On page 477 Herr Williger states that the outsiders constitute 30-40% of the producers of iron.

<sup>3</sup> Reichstag, 1900, p. 364; cf. Laur, II, 122.

<sup>4</sup> *Vierteljahrshefte*, 1903, I, p. 21.

the Ruhr 8.4 m., while Fett was 9.0 m. and 8.0 m. respectively. In the period from 1888 to 1890, Fettkohlen rose in the Saar 47.3 per cent., and in the Ruhr 78.3 per cent. In the period from 1898 to 1901 the same coal rose in the Saar 38.9 per cent., and in the Ruhr 13.2 per cent.<sup>1</sup> Prices in the Saar are fixed generally for the semester from January or July 1; <sup>2</sup> these take the position of normal prices for that term. Such a list is published now, and from a recent one, which appeared in *Glückauf* on May 23, 1903, the following characteristic prices are extracted. It should be stated that in the Saar the coal is specified by mines as well as the usual names for sorts. The coal listed is for railroad use.<sup>3</sup>

Flammförderkohlen :

Kohlwald halbgeseiebte .....	12.80 m.
Griesborn abgeseiebte .....	12.00 "

III. Sorte (lowest.)

Kohlwald } .....	7.20 m.
Göttelborn }	

Fettkohlen :

I. Sorte.

Heinitz-Dechen (highest) .....	16.50 m.
--------------------------------	----------

II. Sorte.

Maybach, Brefeld (lowest) .....	10.20 m.
---------------------------------	----------

For the two sorts of coal for which the prices were given for the last twenty years, namely, Fett and Flamm, (see p. 187), we have already seen a general higher average for the Saar than for the Ruhr. This is a frequent subject of criticism and complaint. Thus Herr Böckel says that the prices of Fettnusskohlen II in the Saar and the Ruhr are 15.50 m. and 12.75 m. re-

<sup>1</sup> *Vierteljahrshefte*, 1903, I, p. 21. The figures given for Fettkohlen for the Ruhr are 1888, 6.0 m.; 1890, 10.7 m.; 1898, 9.1 m.; 1901, 10.3 m. The figures here are slightly different from those of the Essen Börse given in *Essen Handelskammer Reports*.

<sup>2</sup> Abgeord., X Commission, p. 12.

<sup>3</sup> *Glückauf*, 23 May, 1903, p. 499.

spectively,<sup>1</sup> while Herr Paache complains that the Ruhr sells locomotive coal for 11.10 m. while the Saar gets 15.00 m.<sup>2</sup> Even greater differences are shown by Dr. Beumer in the Enquete.<sup>3</sup> In the case of locomotive coal, the public interest can be only an indirect one—high coal prices make dear transportation, and help to excuse high railway tariffs. Nothing hardly could give a better justification of cartell price policy before government inquiry than the fiscal price policy, and the cartell leaders have realized it thoroughly.<sup>4</sup>

The course of prices for the fiscal mines of Upper Silesia is substantially the same as for the private mines. The price-making of the fiscus is technically independent, but practically, it follows in most cases the price policy of the convention.<sup>5</sup> An exception to the general statement appears in the case of coking coal, which is mostly fiscal, and where naturally the fiscus has more influence in price making.<sup>6</sup> The prices of the fiscal mines, as well as the private mines, were raised in 1901,

<sup>1</sup> Reichstag, 1900, p. 364.

<sup>2</sup> Reichstag, 1900, p. 1331.

<sup>3</sup> Enquete, p. 85.

<sup>4</sup> Enquete, pp. 85, 183; *Cent. Verb. D. Indust.*, 1901, p. 236.

<sup>5</sup> Enquete, pp. 344, 348. General Director Williger says: "The fiscus, according to my feeling, takes, let us say, a benevolent attitude towards the convention. (Laughter.) It is not a member, and is not officially invited to the meetings. However, I am permitted, as chairman, to inform the gentlemen who direct it. It has also happened that the gentlemen have been present, and have dined with us." Enquete, p. 344. General Director Bernhardt says: "The relation to the fiscus is very complicated. . . . Nevertheless the situation in general is as follows: the fiscus in reference to the prices of the convention must follow. The fiscus is not in the position to hold prices higher than we, or else its sales decline; and it does not go under our prices worth mentioning." Enquete, p. 348. It is understood between the private mines and the fiscus that the former shall fix the price of Flammkohle. Enquete, p. 468.

<sup>6</sup> Enquete, p. 463.

although the crisis had already made itself severely felt. In the fiscal Saar, on the other hand, the first reduction came in 1901<sup>1</sup>. In Silesia most of the good coking-coal is furnished by the fiscus and the prices for the same under its influence, showed a decided advance (see p. 186). However the fiscus sometimes sells below the prices of the convention.<sup>2</sup> On the whole the fiscal prices in Upper Silesia (on account of their better quality) run higher.<sup>3</sup>

Comparing the fiscus generally with the syndicate or the convention, the judgment would be that there is not much difference between them—if anything the fiscus has put prices up more—as Herr Gothein says it has been “too much the fiscus,” and has not paid enough attention to general welfare.<sup>4</sup> Herr Kirdorf thinks that, at any rate, the syndicate is better than the fiscus.<sup>5</sup>

The price history of Lower Silesia presents nothing new. The general facts are shown by the average annual mine price of gas coal from 1883 to 1902.<sup>6</sup> From

1883 -----	9.9 m.	1893 -----	12.6 m.
1884 -----	9.9 “	1894 -----	12.6 “
1885 -----	9.9 “	1895 -----	12.6 “
1886 -----	9.9 “	1896 -----	12.6 “
1887 -----	9.9 “	1897 -----	12.8 “
1888 -----	9.8 “	1898 -----	13.1 “
1889 -----	10.9 “	1899 -----	13.7 “
1890 -----	13.4 “	1900 -----	17.1 “
1891 -----	12.8 “	1901 -----	17.8 “
1892 -----	12.7 “	1902 -----	16.5 “

<sup>1</sup> *Saarbrücken, Hk.*, 1901, p. 8.

<sup>2</sup> *Enquete*, pp. 592, 182.

<sup>3</sup> Debate of 19th Feb., 1901, over Etat, in Beilage, p. 15, *Glückauf*, 2 March, 1901.

<sup>4</sup> *Enquete*, pp. 182, 70-1.

<sup>5</sup> *Ib.* pp. 185-7.

<sup>6</sup> *Vierteljahrshesfte*, 1903, I, p. 21.

1896 to 1901 we have a rise of 41.3 per cent. This shows a more rapid advancing tendency, which, according to the view expressed in the annual report of the Aeltesten der Kaufmannschaft, of Berlin, is characteristic of the non-cartelled regions.<sup>1</sup> For Lower Silesia *Glückauf* gives quotations for 1900 for Kleinkohlen of 9-10 m., and for Schmiedekohlen 15-19 m.<sup>2</sup>

Respecting the price policy of the outsiders of the Ruhr, there is little to be said, but that is of some importance. The prices of the Essen Börse are substantially the syndicate prices.<sup>3</sup> The general statement is true that the non-syndicate mines get the syndicate prices,<sup>4</sup> and they recognize that a fair policy is pursued towards them by the syndicate,<sup>5</sup> but when the opportunity offers, they break away from the fixed prices of the syndicate and take what the circumstances permit. Thus Abg. Hilbc asserts that recently, when the syndicate was selling at 11.10 m., the outsiders got 13.50 m. to 14.40 m.<sup>6</sup> The syndicate complains in its report of 1899 that, while it has maintained fixed prices, the outsiders have made "usurious" exactions.<sup>7</sup> On the other hand, if sales are difficult, they can shave the syndicate prices, which are known and not easily changed and so make a sale. This was the situation for example in 1901, 1902.<sup>8</sup> As Herr Kirdorf says the syndicate is compelled to

<sup>1</sup> *Bericht d. Aeltesten*, 1900, p. 12.

<sup>2</sup> *Glückauf*, 17 Aug., 1901, p. 714.

<sup>3</sup> Enquete, p. 127.

<sup>4</sup> *Ib.* p. 71.

<sup>5</sup> *Ib.* p. 71.

<sup>6</sup> Reichstag, 1900, p. 288.

<sup>7</sup> Cf. Report, 1899, in *Essen Hk.*, p. 11.

<sup>8</sup> *Zeits. Preuss. Stat. Bureaus*, 1903, p. 8; Enquete, pp. 80-1; Rafalovich, p. 17.

permit the outsiders "to have their fill" <sup>1</sup> right in the coal district itself.

The question of coke prices is chiefly a question of the price policy of the coke syndicate. The course of prices for coke was as follows:

DÜSSELDORF. <sup>2</sup>			ESSEN BÖRSE. <sup>3</sup>		
	Hochofen.	Year.	Hochofen.	Giesserei.	Brech I-II.
	<i>M.</i>		<i>M.</i>	<i>M.</i>	<i>M.</i>
Begin. 1880	20.00	1887---	7.83	8.67	8.32
" 1881	8.20	1888---	9.16	10.36	10.78
" 1882	11.60	1889---	15.72	17.00	17.69
" 1883	12.50	1890---	19.78	22.00	22.61
" 1884	8.00	1891---	13.50	17.00	18.00
" 1885	7.30	1892---	12.00	14.63	16.25
End. } 1886	{ 7.60	1893---	11.00	14.00	15.25
		1894---	11.00	14.00	15.25
Begin. 1887	6.60	1895---	11.00	14.00	15.25
" 1888	8.30	1896---	12.02	14.23	15.19
" 1889	9.50	1897---	13.87	15.96	15.64
" 1890	26.00	1898---	14.00	16.25	16.75
		1899---	14.37	16.69	17.27
		1900---	21.29	23.33	24.37
		1901---	22.00	23.50	24.50
		1902---	15.00	17.50	18.50

These prices after 1890 are practically those of the syndicate.<sup>4</sup> Taking the prices of blast furnace coke from 1891 to 1892, we observe a decline of about 22.7 per cent. up to 1895. With the upward movement of industry comes an advance, which is at first moderate, but concludes with a great leap forward in 1900, an advance of 48.1 per cent. over the preceding year. This is increased a little in the year following, and then drops back to about the former level. From the lowest point (1893-5) to the highest (1901) point, the advance was 100 per cent. The price changes in the other sorts of coke followed the same direction, but were not

<sup>1</sup> Enquete, p. 78.

<sup>2</sup> *Id.*, p. 637.

<sup>3</sup> *Essen Hk.*, 1902, I, p. 71.

<sup>4</sup> Enquete, p. 127.

so great—the advance for the most important sort foundry coke between 1895 and 1901 was from 14.00 m. to 23.50 m., *i.e.*, 67.8 per cent. Comparing the price movement in this period with the preceding period of high prices, we find the latter even more extreme. This, it will be remembered, occurred before the present cartell was organized. Prices advanced on the Essen Börse for blast furnace coke from 7.83 m. in 1887 to 19.78 m. in 1890 or about 127.1 per cent. On the Düsseldorf Börse prices were considerably lower in 1886. The sudden character of the advance in 1890, and the effect of the formation of the cartell is shown further, if we examine the monthly price changes.<sup>1</sup> The

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1889	10.00	10.00	10.50	11.00	..	..	..	..	18.00	19.25	22.00	25.00
1890	27.75	29.75	26.50	25.50	..	..	..	13.75	13.75	13.75	14.00	13.50
1891	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50

change in 1889–90 was much more startling, therefore, as well as higher than in 1900. The equally sudden acquisition of comparative equability under the syndicate in 1890, on the other hand, was due quite as much to the change in the *conjunktur* as to the moderation of the cartell leaders.

We have already spoken of (p. 64) the so-called two year fusion price. The contracts for 1900 had been made at a price of 14.00 m., but the pressure for coke became so strong that it was determined to make a large advance. Those who already had contracted for 1900 at 14.00 m. were offered, in the autumn of 1899, amended contracts covering two years, *vis.*, 1900 and 1901, at a price of 17.00 m.<sup>2</sup> It has sometimes been put as though there were two prices, 14.00 m. for 1900, and 20.00 m. for 1901, and for those who took the two

<sup>1</sup> *Essen Hk.*, 1889, p. 45; 1890, p. 33; 1891, p. 26.

<sup>2</sup> *Enquete*, pp. 638–40.



year contract an average of 17.00 m.<sup>1</sup> This, however, is not the correct position as is shown by the statement of Direktor Plehn, a member of the Vorstand of the syndicate.<sup>2</sup> As a matter of fact those who bought in 1901 had to pay 22.00 m.<sup>3</sup> The table of normal prices bears out Herr Plehn; the Essen Börse quotations show what the current prices were.

The coke price obviously has a pretty intimate connection with the price of coal. In the recent Enquete, Herr Stinnes asserted that, practically, the coke price regulated the coal price, because the latter was determined for Jan. 1, and the former for Apr. 1, and the coking coal price had to be brought into proper relation to the coke price and to the prices for other sorts of coal.<sup>4</sup> This seems a good deal like putting the cart before the horse. Three points may be made against this contention, first that the coal interests dominate the coke interests and include them; the influential producers of Fett coal have, nevertheless, an interest in the coke business which may be antagonistic to the general coal interests; second, the prices of coal have not taken exactly the same course as coke prices; an inspection of the price tables will show that coke did not advance at first when coking-coal advanced, and later coke had a greater advance than coal<sup>5</sup>; third, the

<sup>1</sup> Enquete, p. 646.

"The price of 20 m. may be obtained by calculation, as follows: 14 m. for 1900 + 20 m. for 1901 makes 17 m. for both years; actually, however, the price of 20 m. was never mentioned, but a unitary price of 17 m. was established for both years."

<sup>2</sup> Enquete, p. 660.

<sup>3</sup> *Ib.* p. 660.

<sup>4</sup> *Ib.* p. 65.

<sup>5</sup> Thus in 1894-5 coking coal was advanced from 5.50 to 6.00 m., while blast furnace coke remained at 11.00 m.

price periods have not always coincided.<sup>1</sup> Herr Kirdorf admits indeed the justness of the claim of Herr Stinnes in a limited sense, and cites a case of the price of coking-coal being fixed for a half year only, while the rest was fixed as usual for a year.<sup>2</sup>

The normal coke prices (Verrechnungspreise) are determined by the Aufsichtsrat. The table of syndicate prices for the principal sorts of coke for the twelve years of the syndicate is given below.<sup>3</sup> Taking 17 m.

Year.	Blast furnace.	Foundry.	Brech I-II over 30 mm.	Brech III over 20 mm.	Brech IV under 20 mm.
1890 -----	13.00	15.00	16.00	10.00	6.50
1891 -----	13.00	15.00	16.00	10.00	6.00
1892 -----	12.00	14.00	15.00	9.00	5.00
1893 -----	11.00	13.00	13.50	8.00	5.00
1894 -----	11.00	13.00	13.50	8.00	5.00
1895 -----	11.00	13.00	13.50	8.00	5.00
1896 I Sem. ....	11.00	13.00	13.50	8.00	5.00
1896 II " -----	11.50	13.00	13.50	8.00	5.00
1897 I Sem. ....	12.00	13.50	14.00	10.00	6.00
1897 II " -----	12.50	13.50	14.00	10.00	6.00
1898 -----	14.00	15.00	15.50	12.00	6.50
1899 -----	14.00	15.00	15.50	12.00	6.50
1900 -----	17.00	18.50	19.00	14.00	7.00
1901 -----	17.00	21.50	22.00	15.00	7.00
1902 -----	15.00	17.00	18.00	13.00	6.50
1903 I Sem. ....	15.00	16.00	{ 17.00	12.00	6.50
			{ 16.50		

as the highest price for blast furnace coke (as given in the table), the total percentage advance over the lowest was 54.5 per cent. taking effect in the course of four years. This was much higher than the advance of normal prices in the coal syndicate.

<sup>1</sup> In 1896 the price of coking coal was fixed for the year, while coke was advanced in the middle of the year from 11.00 to 11.50 m.; similarly in 1897. The term of the coke price had run out when the price for cooking coal had run for only one-quarter of its term. Enquete, p. 67.

<sup>2</sup> Enquete, p. 68.

<sup>3</sup> *Id.*, p. 793.

We have to consider coke prices in only two other directions, namely, the outsiders of the Ruhr and the fiscal Saar. In Silesia the coke production has not been cartelled for any length of time; the Silesian fiscus is not important enough in coke to demand a special discussion, and the material, moreover, is too scanty to make a discussion of the price policy worth while. If the outsiders of the Ruhr have made a good thing of it in the coal market, they seem to have done considerably better with coke. The coke syndicate complains in its annual report for 1900 that outside coke producers, as well as dealers, put up the price in an exorbitant manner, and that the syndicate got the blame for it.<sup>1</sup> In the Enquete, Direktor Plehn states that outsiders exacted 22 m. as early as April, 1899, (when the "fusion price" was first under consideration); in August the non-syndicate mines of the Ruhr required 27 m., and it is asserted specifically of the great Haniel mines, Rheinpreussen and Neumühl, that large orders were taken at 35 m. Herr Plehn says :<sup>2</sup>

"So from this standpoint the prices which the syndicate exacted are much more moderate than the prices which have been demanded in other quarters. In the case of non-syndicate mines, no purchaser can claim there was compulsion; it was business which anyone could do or not."

Such prices were possible, of course, owing to the shortage in coke; the syndicate was selling at that time whatever it had to sell for 22 m. in the same territory.

The policy of the fiscus of the Saar gives us the best basis for criticism and comparison of the policy of the coke syndicate. Unfortunately, tables of prices are not at hand, but the average proceeds in this case furnish a

<sup>1</sup> Bericht, 1900, p. 3.

<sup>2</sup> Enquete, pp. 659-660. See also pp. 672-3.

fair substitute, which we may compare with those of the Ruhr.

COKE—AVERAGE PROCEEDS PER TON.

	Saar. <sup>1</sup>	Ruhr. <sup>2</sup>		Saar.	Ruhr.
1890----	21.26 m.	----	1897----	15.19 m.	11.60 m. <sup>2</sup>
1891----	16.46 "	13.11 "	1898----	15.68 "	13.02 "
1892----	15.11 "	10.86 "	1899----	16.96 "	13.29 "
1893----	11.59 "	8.99 "	1900----	20.73 "	16.59 "
1894----	11.60 "	8.77 "	1901----	20.36 "	18.00 "
1895----	12.97 "	9.35 "	1902----	----	15.28 "
1896----	13.66 "	10.10 "			

<sup>1</sup> *Berg-Hütten u. Salinen*. <sup>2</sup> Reckoned from data in *Ber. d. Koks-syndicata*. <sup>3</sup> *Ztg. O. B.-u. H. Ver.*, 1897, p. 202.

On this basis of comparison the coke syndicate does not make a bad showing. Of course the fiscus did not have an entirely free hand—its small output could not be sold above the market price in times of low *conjunctur*, but it was not obliged to sell *over* the syndicate as it did in 1889–1901.

If we compare the prices of coal and coke in Germany with the prices in other countries, we shall find greater steadiness in the former, and on the whole, a lower scale. In cheapness of production, Germany compares favorably with England and has an advantage over all other European producers.<sup>1</sup>

We may first note the effect of the upward movement of 1890 on English and Belgian prices.

*English prices (s. and d.)*

Date.	Gas coal.	House coal.	Foundry coke.
Jan. 1889-----	6/6	6/6	13
April 1889-----	7/6	7/6	14/6
Sept. 1889-----	15	12/6	34
Mar. 1890-----	16	14/6	34
Dec. 1890-----	11	13/6	22
Dec. 1891-----	9/6	12	17
Dec. 1892-----	7	9-10/6	13-14

<sup>1</sup> Cf., *Zeits. f. Gewinnung u. Verw. d. Braunkohlen*, 1902–3, p. 482. The United States shows, however, a marked superiority in this respect which is attributed partly to the use of mining machines.

*Belgian prices (francs.)*

<i>Date.</i>	<i>Mager.</i>	<i>Fett.</i>	<i>Hoch- ofencoks.</i>
Jan. 1889-----	6-6.50	7.50-8	12
April 1889-----	7.50	8.50	13
Dec. 1889-----	13-14.50	17	30-35
Mar. 1890-----	15	18.50	35
Dec. 1890-----	9	12	16.50
Dec. 1891-----	8	11	14
Dec. 1892-----	7	9.50-10	10.50-11

For comparison we give prices for the Ruhr for the same dates.

*Ruhr prices (marks.)*

<i>Date.</i>	<i>Gas- kohlen.</i>	<i>Koks- kohlen.</i>	<i>Flamm- förder.</i>	<i>Hoch- ofencoks.</i>
Jan. 1889-----	8-8.50	5.50-6	6.50-7	9.75-10.50
April 1889-----	9	6.50-7	7.50	12
Dec. 1889-----	15-15.50	12.50-13	12.50-14	25-28
Mar. 1890-----	17	12	15	29
Dec. 1890-----	13	9	10.50	13.50
Dec. 1891-----	12	7	9.50	12.00
Dec. 1892-----	10-12	5-7.50	7-8	10.50-11

*Glückauf*, 1900, 27 Oct., pp. 918-19.

An inspection of these tables shows that the upward movement was not quite so great in Germany as in England or Belgium. This is especially noticeable for coke. Except in the early seventies, there has been no advance in Germany equal to this.

Coming now to the second boom period, we may offer first a comparison between Belgium and Germany, in the price of locomotive coal sold to the state railways.<sup>1</sup>

<i>Belgium.</i>			<i>Ruhr Syndicate.</i>		
1895 Mar. ----	9.20	fcs.	1895 II Sem.	8.50	marks.
1895 June ----	9.60	"	1896 I " "	8.50	"
1896 ----	9.65	"	1896 II " "	9.00	"
1897 ----	11.18	"	1897 I " "	9.00	"
1898 Mar. ----	11.45	"	1897 II " "	9.00	"
1898 Aug. ----	11.55	"	1898 I " "	9.00	"
1899 Apr. ----	14.30	"	1898 II " "	9.60	"
1899 Oct. ----	17.50	"	1899 I " "	9.60	"
1900 Feb. ----	22.50	"	1899 II " "	9.60	"
1900 June ----	22.50	"	1900 I " "	9.60	"
			1900 II " "	11.10	"

<sup>1</sup> Bericht d. Rhein.-Westf. Kohlen Syndicats, 1900, p. 13.

A glance at this table shows the great moderation of the Ruhr syndicate in comparison with the Belgian. In this second period of *hochconjunktur* the course of English prices was as follows :<sup>1</sup>

		s.	d.
Gas Coal -----	{ Begin. 1898 -----	7/3-	7/6
	{ Oct. 1898 -----	10/6	
	{ Jan. 1900 -----	16/6-	17/6
Steam coal -----	{ Begin. 1898 -----	8/3-	8/6
	{ July 1898 -----	12/6-	13
	{ Jan. 1900 -----	16	
House fuel -----	{ Begin. 1898 -----	8/6	
	{ Sept. 1898 -----	15	
	{ Dec. 1899 -----	16	
Steam, small -----	{ Begin. 1898 -----	4	
	{ Aug. 1898 -----	7/9	
	{ Dec. 1899 -----	8/6	
	{ Mar. 1900 -----	11/6	

Here again a comparison with the syndicate or the convention is unfavorable to the English mines. English coal in Cardiff rose from 16 s. in Sept. 1898 to 30-35 s. at the end of 1900.<sup>2</sup> The difficulty here was chiefly a railroad strike in Wales which cut off a large part of the Welsh production from the market.<sup>3</sup> For the year the average contract price according to *Glückauf* were 13/6s., but they were run up in the open market to 25 and 28s. Coke was steady at the end of the year at 20/6-21/0s.<sup>4</sup> In April, 1901, blast furnace coke had fallen to 14-14/6s.<sup>5</sup> For comparison with German prices we may note the following quotations in 1903 :<sup>6</sup>

*English coal prices (s. and d.)*

Northumberland, best gas coal -----	9 - 9/3
" foundry coke -----	17/6-18/0
Cardiff, best sorts -----	14/9-15/3
Monmouth, best half-bituminous -----	13 - 13/9
" blast furnace coke -----	17/6-18
" foundry coke -----	19/6-20
Newcastle, best steam coal, Tyne f. o. b. -----	10/7½

<sup>1</sup> *Glückauf*, 27 Oct., 1900, p. 918.

<sup>2</sup> Enquete, p. 119.

<sup>3</sup> Bericht d. Rh.-Westf. Kohlen Syndicate, 1900, p. 6.

<sup>4</sup> *Glückauf*, Jan. 19, 1901.

<sup>5</sup> *Ib.* April 20, 1901.

<sup>6</sup> *Ib.* July 4, 1903, pp. 676-8.

The general course of English prices (including all sorts of coal) for three important markets was as follows:<sup>1</sup>

Year.	Northum- berland.		Durham.		So. Wales and Monmouth- shire.	
	s.	d.	s.	d.	s.	d.
1883----	5	1.93	4	11.18	9	8.36
1884----	5	1.63	4	8.21	9	10.47
1885----	4	10.70	4	6.74	9	3.37
1886----	4	7.17	4	5.12	8	4.77
1887----	4	7.20	4	5.34	8	0.25
1888----	4	4.01	4	5.31	8	4.22
1889----	5	4.70	5	1.77	10	5.38
1890----	7	7.65	7	3.49	12	0.30
1891----	7	4.06	6	11.63	13	4.89
1892----	6	6.50	6	2.39	11	6.84
1893----	5	11.35	5	6.60	9	8.68
1894----	6	5.99	5	5.38	10	9.34
1895----	5	6.68	5	1.49	9	6.95
1896----	5	0.74	5	1.21	9	1.70
1897----	5	2.91	5	3.80	9	2.84
1898----	6	1.36	5	9.71	10	1.71
1899----	7	0.69	6	11.04	11	0.86
1900----	10	3.57	10	3.72	15	2.00
1901----	8	9.33	8	6.73	16	0.57
1902----	7	4.98	7	3.79	13	6.69

A comparison of these English price statistics with those of the Ruhr is on the whole quite favorable to the latter. The English prices are more variable and follow the fluctuations of industrial activity more closely.

The general course of prices in Belgium is shown in the following table of the average prices at Charleroi:<sup>2</sup>

Menus	gras	Type	1896.	1897.	1898.	1899.	1900.
" demi	"	IV	. 9.65 fcs.	11.18 fcs.	11.55 fcs.	17.50 fcs.	22.50 fcs.
" quart	"	III	. 8.86 "	9.91 "	10.95 "	16.00 "	21.00 "
" maigres	"	II	. 8.00 "	9.00 "	9.90 "	15.00 "	20.00 "
			. 6.70 "	7.73 "	8.24 "	13.25 "	17.81 "

The general average mine price of coal in France is given as follows:<sup>3</sup>

<sup>1</sup> *Colliery Guardian*, 1903.

<sup>2</sup> Villain, p. 139.

<sup>3</sup> *Ztg. Oberschl. B. u. H. Ver.*, 1903, p. 225.

1885 -----	11.73 fcs.
1890 -----	11.94 "
1895 -----	11.01 "
1900 -----	14.95 "

The average mine prices for coal for three of the principal districts of France in 1899 and 1900 were

	1899	1900
Nord and Pas de Calais -----	11.78 fcs.	14.60 fcs.
Loire -----	15.25 "	18.02 "
Gard -----	13.49 "	15.26 "

The average price to the railways was 17.51 fcs. in 1899, 21.14 fcs. in 1900.<sup>1</sup> These are much higher than those obtained in any of the German cartells for railway coal (*cf.* p. 198), though not much higher than the fiscus of the Saar. In 1901 the prices were considerably higher in Pas de Calais and Nord than in the Ruhr. From a price list for August, 1901, it appears that the Fettkohlen ranged from 15 to 30 fcs. and the Halbfett from 15 to 31 fcs. Blast furnace coke was 45 fcs.<sup>2</sup> At that time the price norms for Fettkohlen in the Ruhr ranged from 7.50 m. to 12.50, and Esskohlen from 7.50 m. to 13.50 m.<sup>3</sup> The official view expressed by M. Baudin, minister of public works, was that the *hausse* was not due to an *entente* among the coal producers, but to general industrial conditions.<sup>4</sup> The situation in 1903 is similar. On the new contracts the French prices for Fettförderkohlen with 25 per cent. Stücke run from 16.00 to 17.50 fcs. (about 10.50–11.00 m. in the Ruhr) and for Halbfett 17.50 to 19.50 fcs. (about 9.50–10.00 m. in the Ruhr). Stückkohle is quoted at 31–32 fcs., (12.50 to 13.50 m. in the Ruhr).

<sup>1</sup> *Zeitung Oberschl. B. u. H. Ver.*, 1902, p. 570.

<sup>2</sup> *Glückauf*, Aug. 10, 1901.

<sup>3</sup> *Enquete*, pp. 282–4.

<sup>4</sup> *Savoye*, p. 34.



These French prices are subject to some reduction, for the industrial sorts, for large orders.<sup>1</sup>

These facts are sufficient to show that, not only the advances in prices, both in 1890 and in 1900 were general, and not due to local causes,<sup>2</sup> but that the price advances were higher in other countries than in Germany. This, indeed, is recognized even by some of the opponents of the syndicates.<sup>3</sup>

So far, in speaking of prices, we have had to do almost entirely with non-competitive conditions. Within reasonable limits we may say that it is impossible for the Ruhr to compete in Silesia, or for Silesia to compete in the Ruhr or Saar. In general the great producing regions have complete control of their respective localities, and the organization of production, is such that the prices are hardly competitive. But, as we have seen, these regions sell coal outside of their respective localities, and in most cases they have to meet rival producers. For the examination of the price policy of the various coal producers in the competitive districts, it will be convenient to consider the subject under two heads, first, domestic, second, foreign.

In the undisputed territory of the Ruhr, the price policy is fixed, in general, by the price norms, in the disputed territory, the goods are sold for what they will bring under conditions of competition. The borders of the undisputed territory are Holland, East Friesland and Hamburg on the north, the Elbe on the east, Bavaria (it seems) on the south, and Belgium and Luxemburg on the west.<sup>4</sup> The borders of this region are not

<sup>1</sup> *Glückauf*, Feb. 14, 1903, p. 141.

<sup>2</sup> *Cf.* Minister of Trade and Industry Brefeld, *Abgeord.*, 1900, p. 840.

<sup>3</sup> *Calwer*, 1900, p. 94.

<sup>4</sup> *Cf.* *Enquete*, p. 70.

definitely fixed and freight rates play an important rôle. In the competitive regions the price policy is elastic; generally the prices are less, but sometimes they are *higher*, than in the undisputed region. This is asserted specifically of the Hamburg market where the Ruhr competes with English coal; the extra gains have been considerable.<sup>1</sup> On the whole, of course, there is a loss on the sale, as compared with the price norms, and this must be made up to the individual parties, whose coal is sold, at the general expense. In the second half of 1901, for example, it appears that the syndicate was selling the best sorts of coal in the region of the lower Elbe and Weser at 20% discount on the standard prices.<sup>2</sup>

The situation in Upper Silesia is somewhat different, because at the outset only a minimum price is fixed, and this is below the ordinary market price; the mines sell their output individually, and can raise the prices as much as they please, but they cannot sell below. To this last statement exception is made in the case of sales to the Baltic or North Seas, where in some cases a reduction of the minimum price is allowed,<sup>3</sup> and further in certain cases where Bohemian coal penetrates into the German market.<sup>4</sup>

The practice of the fiscus, at least in the Saar, is substantially similar to the policy of the Ruhr syndicate, namely, a reduction in prices where competition makes it necessary.<sup>5</sup>

<sup>1</sup> Enquete, pp. 71-2. See p. 000.

<sup>2</sup> *Allgemeine Ztg.*, 8 Sept., 1901.

<sup>3</sup> This policy was practiced before the organization of the Convention. Enquete, p. 709.

<sup>4</sup> Enquete, pp. 357, 346-7.

<sup>5</sup> *Ib.* pp. 70-1.

A similar practice exists also in the sales of the coke syndicate ; in general higher prices in the local undisputed region than in the more distant competitive fields.<sup>1</sup>

How this policy of price reduction operates practically can be judged from one or two illustrations. Let us take, first, the Hamburg market where English and Ruhr coal are the principal competitors. The Hamburg coal imports were : <sup>2</sup>

	<i>English.</i>	<i>Ruhr.</i>
1893 -----	1,596,136 tons.	1,003,590 tons.
1897 -----	2,156,000 "	1,452,090 "
1900 -----	3,019,400 "	1,598,200 "
1902 -----	2,792,822 "	1,773,800 "

The competition has always been very sharp here, and we may note that recently the high price policy of the syndicate drove some of the largest Hamburg customers, *viz.*, Hamburg-Amerika Linie, Hamburg-Süd-amerikanischen Dampfschiffahrtsgesellschaft and Deutsch-Amerikanische Petroleumgesellschaft to other (chiefly English) quarters.<sup>3</sup>

The following table gives official statistics of the prices of competing sorts of English and Westphalian coal in the Hamburg market. The fifth column gives the Hamburg price for the Westphalian Nuss, minus the transportation cost (Enquete, page 509) which is compared with the normal (approx. local) price. The prices of the English and Westphalian coals naturally move up and down together according to the *conjuncture*. It appears from the second part of the table that in 1895-6 the syndicate reduced its prices to increase its trade in Hamburg, while with the strong

<sup>1</sup> *Ib.* p. 707.

<sup>2</sup> Ber. Rh. Westf. Kohl. Synd., 1902, p. 12.

<sup>3</sup> *Zeits. d. k. Preuss. Stat. Bureau*, 1903, p. 8.

Yr.	Westf. Nuss gew. Korn I u 2 *	Sunder- land Nuss. **	West Hartley steam. **	Westf. Nuss minus Rail- way rate = 5.60 *	Price Norm Fett Nuss II *	Differ- ence
	m.	m.	m.	m.	m.	m.
1890	19.1	18.6	18.3	13.50	----	----
1891	18.8	17.9	17.1	13.20	----	----
1892	17.7	15.7	15.1	12.10	----	----
1893	16.7	16.3	15.2	11.10	10.00	1.10
1894	16.4	14.9	15.1	10.80	10.50	.30
1895	15.8	13.9	13.4	10.20	11.00	— .80
1896	15.8	13.2	12.7	10.20	11.00	— .80
1897	16.8	13.7	13.1	11.20	11.00	.20
1898	17.3	14.4	14.6	11.70	11.00	.70
1899	18.0	15.6	15.9	12.40	11.50	.90
1900	24.2†	22.7	22.4	18.60	12.75	5.85
1901	20.4†	18.6	17.4	14.80	12.75**	2.05
1902	19.3†	18.2	16.7	13.70	12.50**	1.20

\* *Viertelj.*, 1900, I, p. 18.

† " 1903, I, p. 21.

\*\* " 1902, I, p. 21.

\* *Denkschrift*, p. 21.\*\* *Enquete*, p. 282.

The column of differences has no exact value.

demand of 1899, the prices were put up above the normal prices of the undisputed territory, an advance of an extraordinary character being made in the following year (1900) when it was found impossible to supply the demands of the home market.

In the following table, we have the average wholesale Berlin prices from 1887 to 1899 for three sorts of coal. From the Berlin price of the Silesian coals the average cost of transportation is subtracted, and a comparison made of the differences with the average mine price. The costs of transportation subtracted are averages of all rail and rail-and-water charges given by Sympher<sup>1</sup> for Upper Silesia (Königshütte) and the Waldenburg district (Dittersbach); the average is taken rather than the cheaper rail-and-water alone, because navigation is interrupted for a good part of the year.

<sup>1</sup> Sympher, p. 136.

Upper Silesia, all rail 10.52 m.  
rail and water 8.55 m.

Lower Silesia, all rail 7.39 m.  
rail and water 6.45 m.

	Berlin ab waggon*			Oberschl. Gas		Difference	Niedersch. Gas		Difference
	Westfäl. Gas	Oberschl. Gas	Niedersch. Gas	Berlin price minus frt. = 9.54	Mine price**		Berlin price minus frt. = 6.92	Mine price**	
	m	m	m	m	m	m	m	m	m
1887	16.9	18.3	17.1	8.76	5.9	1.86	10.18	9.9	.28
1888	17.6	18.3	17.2	8.76	5.9	2.86	10.28	9.8	.48
1889	21.1	19.2	18.7	9.66	7.0	2.66	11.78	10.9	.88
1890	24.0	20.3	22.1	10.76	9.5	1.26	15.18	13.4	1.78
1891	23.5	20.3	21.3	10.76	9.2	1.56	14.38	12.8	1.58
1892	21.3	20.3	20.3	10.76	9.1	1.66	13.38	12.7	.38
1893	20.7	20.6	20.0	11.06	9.0	2.06	13.08	12.6	.48
1894	20.8	20.0	20.0	10.46	9.0	1.46	13.08	12.6	.48
1895	20.8	19.6	20.0	10.06	9.0	1.06	13.08	12.6	.48
1896	20.6	19.2	20.0	9.66	8.9	.76	13.08	12.6	.48
1897	20.7	18.5	19.8	8.96	8.7	.26	12.88	12.8	.08
1898	21.3	18.8	20.2	9.26	9.1	.16	13.28	13.1	.18
1899	22.3	19.2	21.2	9.66	9.8	-.14	14.18	13.7	.48

\* *Vierteljahrsheft*, 1900, I, p. 18.

\*\* *Ib.*, 1903, I, p. 21. The differences have no exact value.

An inspection of the second part of the table shows in the columns of differences a greater average margin (between mine price and Berlin price) for Upper than for Lower Silesia, which disappears in the last two years. In the last year (1899) Berlin got her Upper Silesian coal (according to this calculation) cheaper than purchasers in the neighborhood of the mines.<sup>1</sup>

Through these competitive German markets, in Hamburg, Berlin, etc., the price of English coal comes to have a perceptible effect on the general price policy of the syndicate. Thus in 1899, the report of the syndicate complains that the advance in English prices (due to the war in South Africa) had a disturbing effect on the general market.<sup>2</sup> Similarly the English export tax

<sup>1</sup> In 1902 Upper Silesian Gas and Stück sold in Berlin (at R. R.) at 22.04 m., and the mine price was 11.70 m.; subtracting the assumed freight charges (9.54 m.) we have for Berlin 12.50 m., or .80 m. over the mine price. Cf. *Viertelj.*, 1902, I, p. 15.

<sup>2</sup> Bericht d. Rhein-Westf. Kohlen Synd., 1899, quoted in *Essen Hk.*, 1899, II, p. 6.

on coal was claimed to have an effect on the German market;<sup>1</sup> Calwer thinks it really hindered competition.<sup>2</sup> It is true that English importations in Hamburg declined in 1901 as compared with 1900, but 1900 was an extraordinary year. The Chancellor of the Exchequer recently pointed out in Parliament that English exports had increased since 1900, and the price for export had risen more than the shilling tax.<sup>3</sup>

In the sale of coke in the Minette district, there existed formerly specially favorable prices, less, that is, than the price norms in the undisputed territory.<sup>4</sup> This lasted, it seems until about 1899. The reason is, obvious enough. In the Minette district five coal producing regions compete, viz., the Ruhr, the Saar, the Wurm, Belgium and France. The principal competitors of the Ruhr are the last two. With the Belgian and the Wurm districts, deals were made in 1894 by which the field was divided.<sup>5</sup> The partial removal of competition resulted in an improvement in prices which is specially noted as a consequence in two consecutive reports of the coke syndicate.<sup>6</sup> At the same time the French competition in the region, favored by lower freight rates, became sharper.<sup>7</sup>

<sup>1</sup> Bericht d. Rh.-Westf. Kohlen Synd., 1901, p. 13.

<sup>2</sup> Calwer, 1901, p. 104; cf. also Enquete, p. 362.

<sup>3</sup> *Industrie Ztg.*, 3 July, 1903, p. 275; cf. *Ber. d. Aeltesten*, 1901, p. 16; it is said that the tax had no effect on competition.

<sup>4</sup> Enquete, pp. 633-4.

<sup>5</sup> de Leener: *Les Syndicats Industriels en Belgique*, p. 230; Enquete, pp. 625-6, 632.

<sup>6</sup> Reports of 1894 and 1895, in *Bochum Hk.*, 1894, p. 11; 1895, p. 9.

<sup>7</sup> Report of coke syndicate, 1895, in *Bochum Hk.*, 1895, p. 9.

## CHAPTER V

### EXPORT PRICES AND EXPORT BOUNTIES.

The markets for German coal extend beyond the borders of the country, and for all the important export markets, these prices also are competitive.<sup>1</sup> The most important foreign competitive markets are Holland, Belgium, France, Austria and Switzerland. (*Cf.* p. 20.) For Holland and France, the Ruhr and the Saar, respectively, get the business. The export to Russia and Austria is from Upper Silesia. The export to Switzerland is mostly from the Saar.<sup>2</sup>

So far as the Upper Silesian export prices to Austria are concerned, any reduction below the minima prices of the convention has been categorically denied by General Director Bernhardt. He states that, on the contrary, for the export during the strike in Bohemia higher prices were demanded by Upper Silesian mines.<sup>3</sup> Nevertheless, according to Herr Williger's statement, the export to Russia was favored by a lower minimum price, which was claimed to be justified by the high duty levied on coal by that country.<sup>4</sup> This duty is between two and three marks.<sup>5</sup> Coal shipped at lower than the minima prices to the Baltic coast finds an easier export on that account.

In the export policy of the two Ruhr syndicates, we have the cause of the most violent attacks upon them. The encouragement and development of the export

<sup>1</sup> Enquete, p. 78.

<sup>2</sup> *Zt. B. H. u. S.*, 1902, p. 100 (532, 125 tons.)

<sup>3</sup> Enquete, p. 347.

<sup>4</sup> *Ib.* p. 357.

<sup>5</sup> Friedrich, p. 49.

trade in coal was one of the earliest reasons for association among the mining interests (see p. 40), and, indeed, success in promoting it was held to be a very praiseworthy act. In the period when the mines were paying assessments, rather than earning dividends, and coal was very cheap, the coal exporter got all the praise he claimed. But even then the export had to be developed, as it is said, "by sacrifices", that is, by selling at a price (transportation deducted) below the local market.

The earlier objection to low export prices, particularly *export prices below average cost of production*, was that it raised the price at home, because, in order to get a fair profit on the whole, the domestic consumer had to pay enough to cover the difference between the export price and an average paying price. That this is by no means a necessary or even presumptive consequence, and that, on the contrary, low export prices may, by increasing the volume of sale, enable the producer to produce more cheaply, and so to sell more cheaply at home also, although not as cheaply as abroad, was argued from the early days of the export trade by the coal and iron interests.<sup>1</sup>

The argument against low export prices has taken recently a different form. They are held to be against the general welfare on the ground that they give the foreign producers of competing lines of goods, for which the exported article is a material of manufacture, an unfair advantage, and thus enable them to compete, to the injury of the national manufacturer, either in their respective domestic markets or in some

<sup>1</sup>Abgeord., 1903, pp. 1538-9; *Bochum Hk.*, 1886, p. 16; cf. Lotz, p. 18.



common export market.<sup>1</sup> When a cheap export price is made, it is generally because that it is the world market price, or because some special obstacle, such as a customs duty or railroad rate, must be neutralized. In most cases, the foreign competitor would get the commodity just as cheap whether the particular country in question was exporting below the domestic market price or not. Liefmann argues, therefore, that the real cause for complaint is not cheap export prices, but high domestic prices.<sup>2</sup> This is, indeed, in the main correct. But it must be recognized, also, that the increased supply made by the offers of *one* country may depress the price in the competitive market immensely. Again, there may be only two important competitors in the export market; the withdrawal of one as a cheap exporter would perhaps lead to a monopoly of the other, in which case the price would presumably rise, so that the industrial consumers of that country would no longer enjoy exceptional advantages in the price of the material in question. These suppositions are peculiarly applicable to international coal markets. Within certain limits of price, especially in localities removed from water communication, competition is limited at the best. One more general point may be made. The exportation of a greater or lesser quantity of coal has nothing to do with the local supply, and exportation is not designed to produce a scarcity in the local market.<sup>3</sup>

<sup>1</sup> Cf. Resolution of Abg. Oeser, Feb. 17, 1903, demanding the abolition of the customs duty on raw products, where price discriminations are made, in order that producers for export may compete successfully in the world market. Abgeordnetenhaus, 1903, Feb. 17, pp. 1506-7.

<sup>2</sup> Liefmann: *Schutzzoll u. Kartelle*, chap. II.

<sup>3</sup> Prof. Lotz cites from A. Smith a case of a combination of merchants to export a large quantity of a commodity over which they disposed, in order to enjoy the high prices attained by the remainder (p. 16). Some people to-day think the coal exports have the same purpose, but such a policy would be senseless where they control the production, unless the export was in itself advantageous.

A satisfactory determination of this much disputed question of cheap exports would require a much greater amount of information in regard to the facts, at least in the case of coal, than is accessible. The question is a question of values, and hence a quantitative question. We should need to know not only the domestic and foreign prices, but also the amounts purchased and their importance in respect to cost of production for the manufactures under consideration ; further, the markets in which the manufactured goods were offered, the quantities offered by different competitors, etc., etc. Such data evidently are not easily to be obtained, but a few facts are available which throw some light on the subject. The export of coal for 1902 was :<sup>1</sup>

	<i>Germany.</i>	<i>Ruhr Synd.</i>
To Belgium.....	2,217,419 tons.	1,778,680 tons.
To Holland .....	4,540,955 "	4,163,156 "
To France .....	980,967 "	440,335 "

These are the only industrial countries to which the northwestern coal districts export much. A part of the French shipments comes from the Saar, the rest chiefly from the Ruhr. It is known that a considerable portion of the Dutch and Belgian importations are for the steamship lines.<sup>2</sup> A part, undoubtedly, enters into the production of wares which compete with German manufactures. The export to France is mostly industrial. In 1897, the German importations are given as 2,076,600 tons, of which 1,720,100 tons were to the industrial department Meurthe et Moselle. The whole importation was only 5.6 per cent. of the French consumption ; but the German coal in the department Meurthe et Moselle constituted 43 per cent. of the consumption of that district. The Belgian importation for

<sup>1</sup> See pp. 20-21, *supra*.

<sup>2</sup> Reichstag, 1900, p. 284.

the same department was 804,000 tons, or 20 per cent. of the consumption.<sup>1</sup> However weighty the German product was in 1897, it has evidently gone back very much since then, and is less than half of what it was, while the complaints about exports have progressed inversely. When we consider the subordinate character that the German coal plays there to-day, it seems very unlikely that it would try to dictate the price, especially when we consider also that it must encounter a customs duty of 1.20 frcs. per ton, and that only half of it comes from an organization capable of pursuing a very aggressive policy. Further, we have the fact that the proceeds per ton for exports in 1902 were 9.84 m. as compared with 10.45 m. for domestic sales; in 1900, the figures given are 9.82 m. and 10.70 m. respectively, but in 1901 the export proceeds are said to have been higher, viz. 11.22 m., against 11.01 m. for domestic.<sup>2</sup> In respect to the higher export price in the French Minette, confirming testimony comes from a French source. It is said that in 1900 the price of German coal sold in France was raised 2.50 fcs. above the domestic German price. In consequence, the proposition was made in the Chamber of Deputies to remove the customs duty, but this was successfully opposed by the argument that, if the duty were repealed, the Germans would raise the price by the same amount, because they

<sup>1</sup> *Comité Central des Houillères de France*, 1899, Pl. I.

<sup>2</sup> *Enquete*, p. 280. It must be admitted that these figures are subject to some question. On p. 279 the average proceeds per ton of the syndicate for total quantity shipped are stated as 11.01 m., and the average proceeds for exports at 11.22 m. These figures are not reconcilable, a considerable export having been made. It is probably a typographical error.

did not need the market and had only to meet the price of the mines of Nord and Pas de Calais.<sup>1</sup>

In Belgium, the coal production is divided up among a number of cartells in the different districts or "basins." For the coal contracts with the state railways, they meet at Charleroi, and determine the prices and pool the orders. According to de Leener, these prices during a *hausse* are made lower than the ordinary market prices on account of their publicity and for the social effect. These prices, says de Leener, guide the whole industrial coal market, which is completely under the influence of the pool.<sup>2</sup> Under these circumstances, it does not seem likely that the Ruhr syndicate has done much to injure German manufactures by low export prices. During the recent *hochconjunktur*, it is confessed that very high prices were obtained.<sup>3</sup> In Holland, on the other hand, it seems that the syndicate has had to go further;<sup>4</sup> but it does not appear that the German coal importation in Holland is a dominant price-making factor.

A rather sensational story is told by Sayous (on the authority of the *Kölnische Volks-Zeitung*) concerning the sale in 1902 of a lot of 60,000 tons of coking coal,

<sup>1</sup> Ceci est tellement vrai, a dit le rapporteur de la commission, que nous voyons les Allemands majorer de 2 marks leurs prix pour les exportations en France; ils nous vendent 16 marks, soit 20 francs, ce qu'ils cèdent à 17 fr. 50 à leurs nationaux; avec le droit de douane ils arrivent en Meurthe-et-Moselle aux mêmes prix que les charbons du Nord et du Pas-de-Calais; si l'on enlevait le droit de douane, ils augmenteraient leurs prix de 2 à 3 marks, et cela, bien entendu, parce qu'ils ne tiennent pas à exporter, mais au contraire à conserver leur charbon pour leur industrie.

Perquel: La crise du charbon en Allemagne. Paris, 1900, p. 22.

<sup>2</sup> de Leener, p. 227.

<sup>3</sup> Enquete, p. 75.

<sup>4</sup> Abgeord., 17 Feb., 1903, p. 1519.

"at a distance," for 2.00 marks. He says, also, that various sorts of coal are exported, and, disguised by different names, are sold more cheaply than at home.<sup>1</sup>

It is alleged that the fiscus pursues the same policy in exports as the private coal producers;<sup>2</sup> and the exaction of higher export prices by the Upper Silesian fiscus in 1899 is mentioned as a matter of special merit.<sup>3</sup>

There has been quite as much complaint about the cheap export of coke as of coal. The total export of coke in 1902 was 2,182,383 tons;<sup>4</sup> most of this came from the coke syndicate, viz., 1,611,979 tons;<sup>5</sup> the greater part of the remainder was from Upper Silesia. The exports of the Ruhr syndicate were,<sup>6</sup>

France .....	710,870 tons.
Belgium.....	153,947 "
Holland .....	47,778 "
Switzerland .....	100,305 "
Austria.....	186,405 "
Russia .....	75,612 "

Belgium is cartelled with the Ruhr, hence there can scarcely be much injury to German industry there. The export to Holland is too small to be worth considering, and not enough to be decisive as to the price. For practical purposes, it comes down to a question of France and Austria. A story published in the *Frankfurter Zeitung* about a price of 8.10 m. for coke sales in Austria has gone the rounds, and has been cited as an example and proof of the pernicious influence of the coke cartell.<sup>7</sup> Apart from the peculiari-

<sup>1</sup> Sayous, p. 273.

<sup>2</sup> Reichstag, 1902, p. 6100.

<sup>3</sup> *Ib.* 1900, p. 374.

<sup>4</sup> *Monatl. Nachweis u. d. Auswärtige Handel*, Dez. 1902, p. 192.

<sup>5</sup> Enquete, p. 622.

<sup>6</sup> *Cf. supra*, p. 23.

<sup>7</sup> Enquete, p. 643; Abgeord., 1902, p. 6116; Raffalovich, p. 200.

ties of this individual contrast, the defenders of the coke syndicate excused the low price given on account of the high transportation charges which their Bohemian customers had to pay, charges which really left the Bohemian producer at a disadvantage in competition with those works situated near the coal region.<sup>1</sup> The opposition probably came quite as much from Lower Silesian coke interests as from German manufacturers threatened by Austrian competition.<sup>2</sup> Respecting low prices in other countries, there is little information.

Reference is made to prices of 11.00–12.50 marks for Belgium and France, when the normal price was 15 marks.<sup>3</sup> Sayous repeats a story of the inveterate antagonist of the cartells, the *Kölnische Volkszeitung*, to the effect that enormous shipments of coke were being sent to northern France in 1902 at a price near the cost of production.<sup>4</sup> It seems very doubtful if such a shipment affected German industry in any way; still less could a sale to Malaga (Spain), no matter how cheap the price. The story here is that the coke was delivered at 21 shillings.<sup>5</sup> These tales are repeated only as examples of what is given out for popular consumption. Cheap export is not an extraordinary measure; on the contrary, it may be regarded as the normal condition of highly developed industries in periods of depression; on the other hand, in boom periods export prices are often high.<sup>6</sup>

<sup>1</sup> Enquete, pp. 645–6, 650; cf. Sayous, p. 282; *Bochum Hk.*, 1892, pp. 7–8.

<sup>2</sup> Enquete, p. 652.

<sup>3</sup> Raffalovich, p. 18; Abgeord., 1902, p. 6116.

<sup>4</sup> Sayous, p. 283.

<sup>5</sup> *Id.*, p. 282; he reckons transportation to Malaga at 10–10.50 marks.

<sup>6</sup> Kirdorf, Enquete, p. 75.

The only real evidence concerning the significance of the export rebates are, first, the proceeds, domestic and foreign, and, second, the "Umlage". In respect to proceeds, unfortunately, the material is very insufficient, covering only three years. These years, however, are of special interest, because they include the *hausse* of 1900 and the depression of 1902. For coal, they were:<sup>1</sup>

<i>Year.</i>	<i>Domestic, aver. proceeds.</i>	<i>Exports, aver. proceeds.</i>
1900 -----	10.70 m. -----	9.82 m. -----
1901 -----	11.01 " -----	11.22 " -----
1902 -----	10.45 " -----	9.84 " -----

The rise in the domestic price in 1901 is presumably to be explained by the fact that in the internal "disputed territories" smaller concessions were made; on the other hand, the low price for exports in 1900 may be explained by the fact that most of the exports were sold by previous contract. The prices for 1902 show the situation in a year when the syndicate was fiercely blamed for its export policy. The exaggerated accusations of its opponents fall rather flat before this showing, and its correctness has not been impeached. Corresponding data are provided for the export receipts of the coke syndicate; a slight dissimilarity should be noted, namely, that the average proceeds from export are given for all kinds of coke, while the internal price (not proceeds) is given and for blast furnace coke only, (though this is about 80 per cent. of the total). The total average selling price per ton is also given.<sup>2</sup>

<i>Year.</i>	<i>Domestic, aver. price to Blast Furnaces,</i>	<i>Export, aver. proceeds per ton.</i>	<i>Total Sales, av. selling price per ton.</i>
1900 ----	17.00 m. ----	16.12 m. ----	16.70 m. ----
1901 ----	17.00 " ----	16.86 " ----	18.00 " ----
1902 ----	15.00 " ----	13.11 " ----	15.34 " ----

<sup>1</sup> Enquete, p. 280.

<sup>2</sup> Enquete, pp. 649, 668, 792.

The second column contains simply normal prices for the principal sort of coke; the most valuable parts of the table are the third and fourth columns. The export proceeds run lower, in every case, than the domestic average price for blast furnace coke, which, when the height of the *hausse* is considered, is rather surprising. Perhaps the relatively low receipts for export of 16.12 m. were due to the existence of contracts made previously to the development of the demand. Much more information is required as to the facts before any very confident conclusions could be drawn, but, as far as the data show, there was not discrimination enough in the export prices to be very dangerous to German industry.<sup>1</sup> Individual cases of a character injurious to German industry have undoubtedly occurred,—the low prices in Austria for coke may be fairly classed as such; but this does not involve the condemnation of the whole system. Further, it may be said that these sporadic low prices often do almost as much harm to the foreign competitor as they do good to the foreign customer, so that from an international competitive standpoint the disadvantage is not all on one side.<sup>2</sup>

Perhaps after all the best argument against the extreme views<sup>3</sup> as to the injury caused to home production

<sup>1</sup> In respect to the comparison of proceeds, it should be stated that to estimate the real difference between domestic export prices, we should know more about the quality of coal in each case. It is probably true that the export represents a higher average quality. Hence a lower rate of average proceeds would mean a greater discrimination against the domestic consumer than appears. Cf. Enquete, p. 94.

<sup>2</sup> Cf. Raffalovich, p. 65. Cet état de choses anormal, très nuisible aux industries allemandes de transformation, est funeste aussi aux concurrents de l'Allemagne, car il equivaut à la désorganisation du marché.

<sup>3</sup> Cf. Huber, p. 144.



by these low export prices is the plain fact that the market prices abroad are in general quite as high or higher. It is absurd to suppose that the syndicates take less than they can get. *Very low* export prices therefore are abnormal, and are made to get rid of stock. In order to keep the production going on a steady basis, this must be done from time to time, because the demand cannot be figured exactly. The domestic price might be reduced, but this latter course seems impolitic to the syndicates, not only from the point of view of their own profits, but also from that of their regular customers who have contracted to pay schedule prices.

Herr Bernstein, the celebrated leader of the socialists, has denounced this practice as treason,<sup>1</sup> and it has been condemned by many critics of cartell policy;<sup>2</sup> on the other hand, some have justified it within certain limits.<sup>3</sup> As Steinmann-Bucher has observed, such a policy tends to promote the development of international cartells.<sup>4</sup>

The complaints from iron and textile interests, in 1891, on account of the low export prices of the Ruhr syndicates, led to an official investigation by the Prussian government. To the claim of the syndicates that their price policy was their own private business, the minister of commerce and industry replied that it was the duty of the state to promote the economic welfare

<sup>1</sup> Reichstag, 1902, p. 6092.

<sup>2</sup> *E. g.*, Kuhlo, pp. 14-16; Oeser, p. 14; Juliusberg, p. 22; Bücher, *Ver. f. Soc. Pol.*, p. 148; Francke, *Zeitschr. Preuss. Stat. Bureau*, 1903, p. 8; Naumann, *Nat. Soz. Verein*, 1902, p. 77.

<sup>3</sup> *E. g.*, Liefmann, *Unternehmerverbände*, pp. 164-5; Brentano, *Ver. f. S. Pol.*, p. 182; Franz, p. 7; Steinmann-Bucher, *Wesen*, etc., p. 177; Urban, p. 18.

<sup>4</sup> Steinmann-Bucher, *Wesen*, etc., p. 179.

of the people, and in doing so, it would use the means at its disposal, whether in the allowance of favorable railroad tariffs, or in the withdrawal of the same.<sup>1</sup> The coal people seem to have seen the point, and, since then, have adopted the safer arguments of practical expediency. On the other hand, the government refuses to-day to interfere in such cases;<sup>2</sup> and they could hardly make such a complaint with self-respect, since their own practices in that direction are extensive.

The high cost of raw materials in Germany makes it necessary for the German manufacturers to charge a high price in the local market; even if it is not necessary, they generally do, protected, as they are, from foreign competition by customs duties, and from internal competition by cartells. In the world market, on the other hand, they must meet a different situation—a competitive price and a price that is sometimes below the cost of production even of the most favored producers. If the domestic market is strong enough to accept large quantities at high prices, they can increase their profits by exports, even if they must sell below cost; if, however, the home market is not strong, especially if the demand is weak, and at the same time the cartell organizations do not exist, or are not strong enough to maintain prices, then export becomes a precarious resource, and may be carried on at a heavy loss simply to keep the works employed.

Under such circumstances, the pressure on the raw material cartells to reduce their prices is naturally very heavy, but they are loath to reduce prices for these ail-

<sup>1</sup> *Bochum Hk.*, 1901, p. 9; *J.-B. Verein Dortmund*, 1890, p. 112. The complaints cited a case of coal sales to Rotterdam at 117 marks and to Coblenz at 150 marks per 10 tons.

<sup>2</sup> *Cf. Reichstag*, 1903, pp. 1515-16.

ing industrial branches, because that practically carries with it reductions for an immense amount going in other directions.<sup>1</sup> One obvious way to evade the difficulty would be to offer special rebates; a more flexible system, however, is that of export bounties or premiums to the consuming industries.<sup>2</sup> It appears that as early as 1882 the raw iron interests of Westphalia and Siegerland gave price rebates to certain groups of rolling mills.<sup>3</sup> For the coke syndicate, this policy appears to date from 1892.<sup>4</sup> The report of the coke syndicate for 1892 states that a bounty of 1.50 m. per ton export of raw iron was granted to the Siegen blast furnaces and to the Roh-eisenverband.<sup>5</sup> This was kept up in 1894<sup>6</sup>; in 1895, the bounties are stated to have been 1.50 m. for raw iron and 2 m. for Spiegeleisen.<sup>7</sup>

Information respecting the coal export premiums is less precise. Raffalovich<sup>8</sup> speaks of bounties in the mining and metallurgical industries, beginning in 1891, which were paid by the coal, iron and Halbzeng cartells. This bounty was normally 15 marks. It was modified further in two ways, first, by the limitation of the total amount payable, and second, by differentials according to geographical situation. One purpose alleged for its continuation during the prosperous years 1895-1899 was the desire to retain for the bounty paying cartells the exclusive custom of the beneficiaries of

<sup>1</sup> Enquete, p. 178.

<sup>2</sup> Hirsch, *Cent. Verb. D. I.*, 1901, p. 212.

<sup>3</sup> Liefmann, *Unternehmerververbände*, p. 166.

<sup>4</sup> Liefmann, *Schutzzoll*, p. 31.

<sup>5</sup> Rept. coke syndicate in *Bochum Hk.*, 1891, p. 9.

<sup>6</sup> Rept. coke synd., *Ib.*, 1894, p. 11.

<sup>7</sup> *Ib.* 1895, p. 9.

<sup>8</sup> Raffalovich, p. 23.

the same.<sup>1</sup> In 1896 the coal interests refused a bounty to wire, on the ground that wire manufacturers should direct their claims rather to the raw iron interests, because raw iron was a more important material for them than coal.<sup>2</sup> It seems to have been granted to them willingly a little later, and then suddenly withdrawn about 1898 or 1899, on the ground that the raw iron people were putting up prices so rapidly that the iron industry must be considered capable of taking care of itself.<sup>3</sup> In 1901, the export bounty system was put in full blast again<sup>4</sup>; the exclusive customers of the coal and Halbzeug cartells were allowed 15 m. per ton of exports, on a contingent of 33  $\frac{1}{3}$  % of the total output of the Halbzeugverband. Of this bounty 5 m. was paid by the coal syndicate.<sup>5</sup> It appears that outside of this, the coal syndicate allowed to iron exporters (who were exclusive customers) an export bounty of 2 m. per ton.<sup>6</sup> The export premium stimulated the sale of raw iron in 1901, though the production was very heavily contracted; rolled iron also was exported with energy but the rolling mills complained of the exportation of Halbzeug at cheap prices, which gave their foreign rivals an undue advantage.<sup>7</sup>

In 1902 the system was reorganized on a more elaborate scale. On February 1, 1902, a meeting was

<sup>1</sup> Liefmann places the beginning of these coal premiums in 1893. *Schutzzoll u. Kartelle*, p. 31.

<sup>2</sup> *Id.*, p. 165.

<sup>3</sup> Enquete, p. 163. Among the standing committees of the coal syndicate in 1899, one was on export bounties; cf. *Industrie Ztg.*, 1899, p. 46.

<sup>4</sup> Bericht d. Rh. Westf. Kohl. Synd., 1901, p. 13.

<sup>5</sup> *Düsseldorf Hk.*, 1901, p. 14.

<sup>6</sup> Wieser, p. 307.

<sup>7</sup> *Bochum Hk.*, 1901, pp. 107-12; cf. Enquete, vol. VI, *passim*.

held at Cologne of leaders of the coal and iron interests to consider the organization and policy of export bounties. Herr Kirdorf proposed an arrangement between the following syndicates, namely coal, coke, the three raw iron cartells of the west (viz., Westphalia, Luxemburg and Siegen) the Halbzeugverband, the Trägerverband and the wire and plate cartells. The coal, raw iron and Halbzeug were to pay the bounties in certain fixed sums, and proportions; the payments of the coal cartell to be made to the raw iron, and the raw iron to add the same to its own contribution and pay to the Halbzeug cartell which should pay directly to the exporter. This indirect system was to be established to secure for each syndicate some control over the other, because the fundamental principle of the arrangement was that the products of the combined cartells should be used exclusively in the manufacture of the subventioned exports. Control over the whole operation was to be secured further by a bureau to be established in Düsseldorf, which was called the export accounting office (Abrechnungsstelle für die Ausfuhr). This office was to be entrusted to two agents who were to execute the determinations of a council of supervision (Aufsichtsrat) in which the coal, coke, Düsseldorf and Luxemburg raw iron and the Halbzeug and beam cartells should have representatives. The expenses of the office were to be covered by a 1% tax on the bounties paid. This council of supervision was to decide the amount and duration of the bounties and to adjudge disputes.<sup>1</sup> According to the Düsseldorf chamber of commerce, the

<sup>1</sup> *Industrie Ztg.*, 14 Mar. 1902, p. 90. Raffalovich, pp. 24-5.

bounties actually allowed for the fourth quarter of 1902 were as follows :<sup>1</sup>

1.50 m.	per ton for coal.
2.50 "	" " raw iron (excl. coal bounty).
10.00 "	" " Halbzeug (incl. coal and iron bounty).

These were continued during the year 1903.<sup>2</sup> This system requires that the executive officers of the Abrechnungsstelle may have a sight of the books and papers of the concerns claiming the payment of export bounties, a condition that not unnaturally was extremely disagreeable to the claimants.<sup>3</sup> Some of the rolling mills receiving bounties thought they ought to have a seat and voice in the council of supervision.<sup>4</sup>

As a basis for the allowance of bounties, a table was constructed giving the estimated quantity of material required in the successive stages of manufacture.<sup>5</sup>

<i>Coal consumption.</i>	<i>Tons.</i>
Per ton Bessemer ingots.....	.150
" Siemens-Martin ingots.....	.350
" blooms and billets.....	.550
" rails, beams, etc.....	.600
" rods (from billets).....	.500
" drawn wire, wire nails (from billets).....	.800
" bar iron, angle iron, etc. (from billets) ...	.350
" plates.....	.700

<sup>1</sup> *Düsseldorf Hk.*, 1902, p. 34.

<sup>2</sup> *Kartell-Rundschau*, pp. 48, 819; *Industrie Ztg.*, 1902, 12 Dec., p. 553. It is currently reported that, since the formation of the new Stahlwerksverband, 1904, the export bounties have been allowed to that cartell exclusively.

<sup>3</sup> Herr Abg. Dr. Müller said in the Abgeordnetenhaus—"Das Rundschreiben des Syndikats redet ja in dieser Beziehung eine nur allzu deutliche Sprache, die jeden Zweifel ausschliesst über die Stellung, die der Verband im Verkehr mit "seiner" Kundschaft sich anmasset. Das ist nicht der Ton, den gleichberechtigte Interessenten zu einander anschlagen. So spricht der Vorgesetzte zu seinen Untergebenen, so spricht der Despot zu seinen Sklaven, (sehr wahr ! links), so spricht der Feudalherr zu seinen Hörigen," etc. Reichstag 1902, p. 6146.

<sup>4</sup> *Enquete* p. 173.

<sup>5</sup> *Raffalovich*, pp. 25-6.

*Coke consumption.*

Per ton iron .....	1.100
"    ingots .....	1.300
"    half-products, rails, girders, etc.....	1.350
"    bar iron, rods .....	1.400
"    drawn wire.....	1.500

*Iron consumption.*

Per ton ingots .....	1.150
"    half-products, rails .....	1.200 <sup>1</sup>
"    bar iron.....	1.250

*Half-products consumption.*

Per ton rods .....	1.060
"    bar iron, plates.....	1.100

*Rods consumption.*

Per ton wire, nails .....	1.100
---------------------------	-------

How these tables are practically applied can only be conjectured. It would seem that the exporter of raw iron should receive on account of coal and coke; (1 t. coke equals 1.43 t. coal) about 2.35 m. per ton iron; the exporter of rails about 6.80 m. per ton of rails; the exporter of rods, 13.33 m. per ton of rods.

The large "mixed" works complained that the grant of export bounties to the "pure" rolling mills injured the export market by depressing prices.<sup>2</sup> The rolling mills, on the other hand, claimed that they had to meet the competition abroad of rolling mills using German half-products obtained at cheap export prices.<sup>3</sup> Under such circumstances, it does not seem difficult to believe that the actual export bounties are not an equivalent.<sup>4</sup> The situation in respect to fuel seems to have a more equal aspect. It is said, for example, that coke was sold in Germany for 17.50 m., and abroad (Belgium, Luxemburg and France) at 12.50<sup>5</sup>; this is a difference

<sup>1</sup> 4.200 in original.

<sup>2</sup> Enquete, pp. 178-9.

<sup>3</sup> Raffalovich, pp. 27-8; Abgeord., 1903, pp. 1525-6.

<sup>4</sup> *Id.*, 1903, p. 1526.

<sup>5</sup> *Ib.* p. 6116.

of five marks. From this the duty, 1.20 francs, would be deducted. The bounty for coke consumed appears to be 2.15 m. per ton coke. In the case of coke, however, the freight plays an important rôle in handicapping the foreign purchaser, and even an advantage of 2.85 m. in coke would not seem to give the manufacturer of raw iron in the French Minette any advantage over one in Westphalia<sup>1</sup> or Siegerland—quite the reverse. In saying this, no advocacy of the general system is intended, which is almost, if not quite, as Rousiers says, “*dans toute sa beauté, le régime du sucre*,”<sup>2</sup> the point of the above statement is simply this, an injury to certain German industries in this respect seems to be alleged rather than proven. Even if we agree with Prof. Lotz that the price policy of the coal and coke syndicates makes the protection of the iron industry a necessity, it would not be on the ground of the export policy as hitherto practiced.<sup>3</sup> The important question for them, as for the public, is the internal price policy.

The bounty system is essentially a part of the price system—a form of rebate; these rebates, together with the low export prices and the low prices in the competitive regions, form a source of liability for the syndicate which must account for the sale of the coal of its members at fixed prices. Principally to cover these liabilities the syndicate must levy a general tax on the proceeds of the sale. This is called the ‘Umlage.’ The Umlage is particularly interesting as it affords a gauge of the magnitude of these expenses, but we can-

<sup>1</sup> For the German Minette, not only the French duty, but also competitive prices should be taken into account.

<sup>2</sup> Rousiers, p. 177.

<sup>3</sup> Cf. Lotz, p. 25.



not take the gross sum of the Umlage, because a part of it is levied to cover other administrative expenditures. As the necessary data are not available for the whole term, the statistics for the coal syndicate present a very incomplete appearance; for the coke syndicate only the Umlage itself in per cent. and total is obtainable. The first report of the coal syndicate gave the total Umlage and also the amount paid in compensation. The latter shows approximately what the cut from the regular prices was in the competitive regions, *domestic* and *foreign* (minus any possible excess proceeds).<sup>1</sup> The difference between the Umlage and the compensation gives the amount available for administration, *etc.*, and also for bounty payments.<sup>2</sup> The available data may be tabulated as follows:<sup>3</sup>

(1) Year.	(2) Total proceeds Syndicate Sales.	(3) Umlage %	(4) Amount of Umlage.	(5) Compensation.	(6) Difference
1893-----	-----	----	912,143	643,799	268,344
1894-----	124,541,419	----	-----	-----	-----
1895-----	195,955,623	----	-----	-----	-----
1896-----	222,270,410	8.50	18,892,985	-----	-----
1897-----	254,670,742	8.25	21,010,336	18,755,041	2,255,295
1898-----	277,069,403	8.75	23,243,476	-----	-----
1899-----	311,598,473	6.88	21,457,942	-----	-----
1900-----	384,666,476	3.88	14,925,059	11,820,350	3,104,710
1901-----	396,049,892	6.00	23,762,994	20,920,764	2,842,230
1902-----	361,121,321	6.00	21,667,279	20,001,111	1,666,169

<sup>1</sup> Cf. Enquete, p. 72. These were realized in some years.

<sup>2</sup> Dr. Vogelstein is the only writer noticed who has made any attempt to get at these facts, which he finds directly from the syndicate report of 1893, and estimates for 1897.

<sup>3</sup> Column (2) from Enquete, p. 279. Column (3) from *Dortmunder Jahrbuch*, 1901, p. 551, except 1901, 1902, from *Berichte d. Kohlen Syndicats*. Column (4), 1893 from Vogelstein, p. 76, rest from (2) and (3). Column (5), 1893 from Vogelstein, rest reckoned from (4) and (6). Column (6), 1893 and 1897 from Vogelstein, rest from *Berichte d. Kohlen Syndicats*.

It is evident that the amount paid out for compensation (for cuts below the standard prices) greatly exceeded the total export bounties, whatever they may have amounted to, figured per ton of coal, but it must be remembered that these include domestic as well as foreign sales, and not only the low prices of the competitive domestic territory, but also for other sales, *e. g.*, state railways.

The data for the coke syndicate are even more meagre. In the following table only the total Umlage is reckoned because the differences are not known.<sup>1</sup>

(1) Year.	(2) Tons sold.	(3) Average proceeds.	(4) Calculated total proceeds.	(5) Umlage. %	(6) Calculated total Umlage.
1891-----	2,855,000	12.85	36,686,750	5.25	3,081,508
1892-----	4,025,053	10.46	42,102,054	14.44	6,079,536
1893-----	4,196,917	8.73	36,639,085	21.98	8,053,270
1894-----	4,736,195	8.44	39,973,486	22.75	9,093,968
1895-----	4,821,787	9.05	43,637,172	18.00	7,854,690
1896-----	5,574,695	9.81	55,687,758	15.00	8,353,164
1897-----	6,041,119	10.76	65,002,440	13.50	8,775,329
1898-----	6,415,683	12.79	80,056,646	9.10	7,285,156
1899-----	7,045,923	13.19	92,935,724	7.33	6,812,189
1900-----	7,786,347	16.70	130,031,995	4.50	5,851,440
1901-----	6,833,567	18.00	123,004,206	2.75	3,382,616
1902-----	6,873,162	15.34	105,434,305	4.08	4,301,720

There are no export bounties in Upper Silesia, the

<sup>1</sup>(2) Sale and production are given as equivalent in the coke syndicate; *Cf.* Bericht, 1902, p. 4, etc., except in 1891 when the syndicate sold 2,855,000 tons out of a production of 3,937,773 tons; *Cf.* Report of 1891 in *Bochum Hk.*, 1891, p. 11; 1897 is calculated from 1898 from percentage increase of same. (3) *Dortmunder Jahrbuch*, 1901, p. 558; except last 3, for which see Enquete, p. 792 (the figures are proceeds rather than prices). (4) Product of (2) and (3). (5) The first five are approximations estimated from a statistical diagram in Bericht d. Cokssyndicats, 1900, Appendix; the rest are specifically given in *Dortmunder Jahrbuch*, 1901, p. 561, except the last two which are from Berichte d. Cokssyndicats, 1901 and 1902. (6) Product of (4) and (5).

character of the organization precluding any such policy.<sup>1</sup>

It is very easy to criticize and condemn export bounties, and few probably would be found who regard them as wholly satisfactory. It is certainly possible, however, to show cases, especially for manufactures, where the bounty policy is in itself capable of promoting national interests,<sup>2</sup> but the present discussion has to do with a concrete and practical situation which furnishes more evident justification for such a policy. When other countries are exporting at prices based on a bounty system, the individual country may be often compelled to imitate them to save great losses. In the sugar industry, these bounties were paid by the governments of the producing regions, and the only way to do away with the system was to make an international treaty for their abolition and to provide for the establishment of penalty custom taxes on the sugar imports of countries refusing to do the same.<sup>3</sup> Even those who opposed the system recognized the wisdom of abolishing it in this way.<sup>4</sup> The Russian Finance-Minister de Witte, though refusing to give Russia's consent to this agreement, has favored a larger scheme, which should include other products, as well as sugar, and

<sup>1</sup> Enquete, pp. 467-8.

<sup>2</sup> Cf. Edgeworth, *Econ. Jour.* IV, 48.

<sup>3</sup> Brussels Convention, art. 3.

<sup>4</sup> Germany tried to go alone before, and had to give it up. In a speech in the Reichstag Graf Posadowsky said: "Wir sind mit dem Gesetz von 1891 die Prämientreppe hinuntergegangen in der Hoffnung, dass unsere Konkurrenten uns auf diesem Wege folgen würden. Unsere Konkurrenten haben es aber vorgezogen, an ihrer reichbesetzten Prämientafel sitzen zu bleiben, innerlich wahrscheinlich herzlich froh, dass sich der lästige Mitesser von ihnen entfernte. Reichstag Protokoll, 1896, Mar. 2, p. 1159.

cartell bounties, as well as government bounties.<sup>1</sup> One country cannot act independently, however, in many cases at least, without losing more than is gained.

From this point of view the policy of paying cartell bounties may be often necessary; the difficulties in their effective adjustment limit their extension through many grades of industry. This is true in the iron industry for the small iron products which have not yet succeeded in forming a cartell.<sup>2</sup> Different opinions naturally prevail in both coal and iron circles concerning this matter. It is easy to understand that on the principle of self-interest, or of real or alleged impracticability due to complexities, that the former should oppose it;<sup>3</sup> while in the iron industry, those who have their coal supply cannot be expected as coal producers to desire to contribute bounties to their rivals.<sup>4</sup> The Essen Handelskammer, which represents both coal and iron, is a strong advocate of the bounty system;<sup>5</sup> the Düsseldorf Handelskammer, which stands particularly near the iron interests, though supporting the policy, does not regard the present solution as satisfactory.<sup>6</sup> The Saarbrücken Handelskammer makes a demand on the fiscal administration for lower coal prices for the coal used in the manufacture of exports.<sup>7</sup> It is not difficult to comprehend why the iron interests should favor the policy; for the coal people, it means keeping alive a large demand without great reductions in price.

<sup>1</sup> Raffalovich, p. 198.

<sup>2</sup> Enquete, pp. 198-9.

<sup>3</sup> Cf. Effertz, (1895) p. 16 (Genl. Director, Königsborn).

<sup>4</sup> Cf. Gen. Direktor Williger of the Kattowitzer A. G. f. Bergb. u. Eisenhütten-betrieb and Gen. Direktor der Oberschlesische Kohlenkonvention. Enquete, p. 481. He opposes them.

<sup>5</sup> *Essen Hk.*, 1898, p. 6; 1902, pp. 8, 10.

<sup>6</sup> *Düsseldorf Hk.*, 1901, p. 17.

<sup>7</sup> *Saarbrücken Hk.*, 1900, p. 7.

## CHAPTER VI

### EFFECT OF PRICE POLICY ON INDUSTRY

We have attempted to state the facts essential to a fair view of the course of prices of coal and coke; we have now to undertake the more difficult problem of estimating their relation to the market, that is, to the industrial situation and general prices. The advance in the price of an article can be generally explained, and perhaps justified, by proof of either advance in costs or increase in demand. The first proposition is self-evident, the second would be generally admitted, unless there were some monopolistic limitation of production. Rapid industrial development often tends to produce a high level of prices; and so far as the commodities whose prices have advanced enter into productive consumption, a high level of prices tends to produce high costs. Producers of raw materials are by no means free from this extra cost. The general rise of prices also brings with it, more or less quickly, a rise in wages. But in any case, leaving the question of costs out of consideration, a general level of high prices may be regarded as characteristic of boom years for which no particular sort of industrial organization can be held responsible. During such a period, a high level of prices in a particular industry cannot be regarded as peculiarly injurious or reprehensible.

In discussing the history of the coal cartells, we have traced some points in the industrial development of Germany in the last three decades. In general, we have observed that the prosperity of the coal industry varied with the prosperity and activity of German in-

dustry as a whole, and, in particular, with iron. The most striking exception to this statement is found in the last three years, when the crisis left the iron industry crippled, while the coal industry remained prosperous. So far as coal is an object of general consumption, for house fuel, gas works, railroads, etc., the industrial situation has little effect on the demand. On the other hand, its industrial use depends chiefly on iron. According to the table for the Saar (on page 12) the consumption of coal in the iron industry (including machine factories) is 29.30 %, against 14.87 % for other industries. For the Ruhr, the industrial consumption, and particularly the iron consumption, is of still greater importance. The most appropriate means, therefore, of measuring the market situation in respect to coal is the price schedule of iron. For coke, on the other hand, there are two factors of great importance, viz., the price of coking-coal and the price of iron.

Yr.	Düsseldorf <sup>1</sup> Qualität Puddeleisen.	DORTMUND. <sup>2</sup>		BRESLAU. <sup>2</sup>	
		Bessemer.	Thomas.	Gießerei.	Puddel.
	m.	Aver. annual	Aver. annual	Aver. annual	Ave. annual
1883	Begin. 62	60.6	48.8	63.6	57.8
1884	" 52	53.1	43.9	60.3	54.5
1885	" 47	45.8	41.3	56.5	48.3
1886	" 41	42.6	39.0	51.3	43.5
1887	" 46	49.0	43.2	54.2	49.5
1888	" 50	52.7	45.3	58.0	52.0
1889	" 52	65.9	54.8	65.0	58.5
1890	" 92	79.8	61.0	74.4	66.6
1891	" 53	62.1	49.5	54.8	48.2
1892	" 50	57.8	49.3	52.6	48.9
1893	" 47	52.0	45.5	52.5	50.2
1894	" 42	52.0	45.2	50.3	49.3
1895	" 45	52.0	45.6	49.2	48.3
1896	" 52	59.0	52.8	57.5	57.9
1897	" 60	63.4	57.5	61.7	61.3
1898	" 59	63.5	57.0	61.6	59.7
1899	" 61	65.4	58.5	75.5	72.1
1900	" 69	86.7	78.0	90.7	---
1901	" 90	---	---	66.5	---
1902	" 60	74.0	57.0	61.3	---

<sup>1</sup> Enquete, p. 637.<sup>2</sup> *Vierteljahrshefte*, 1902, p. 20.

An analysis of this table and the Essen price quotations brings out the following facts. From 1886 to 1890 Düsseldorf Puddeleisen advanced 124.4 %, Essen Fettförderkohle advanced 91 %, Essen blast-furnace coke advanced (1887-1890) 153.9 % ; from 1894 to 1901 Düsseldorf Puddeleisen advanced 114.2 %, Essen Fettförderkohle advanced 28.8 %, Essen blast-furnace coke 67.9 % ; the decline of the same iron from 1901 to 1902 was 50 %, the decline of the same coal 6.8 %, and the same coke 31.8 %. A more readily perceptible comparison may be gotten by taking the ratio of the price of coal to the price of coke, and the price of coke to the

## PRICE RATIOS

Year.	One ton blast furnace coke to one ton Fettk. Essen.	One ton Düsseldorf Puddeleisen to one ton blast furnace coke—Essen.	One ton Dortmund Thomas-Eisen to one ton Essen blast furnace coke.
1887 . . . . .	1.39 . . . . .	8.11 . . . . .	5.51
1888 . . . . .	1.51 . . . . .	5.46 . . . . .	4.95
1889 . . . . .	1.85 . . . . .	3.31 . . . . .	3.49
1890 . . . . .	1.85 . . . . .	4.65 . . . . .	3.09
1891 . . . . .	1.37 . . . . .	3.93 . . . . .	3.66
1892 . . . . .	1.41 . . . . .	4.17 . . . . .	4.11
1893 . . . . .	1.37 . . . . .	4.27 . . . . .	4.14
1894 . . . . .	1.38 . . . . .	3.82 . . . . .	4.11
1895 . . . . .	1.38 . . . . .	4.09 . . . . .	4.15
1896 . . . . .	1.46 . . . . .	4.33 . . . . .	4.31
1897 . . . . .	1.57 . . . . .	4.33 . . . . .	4.15
1898 . . . . .	1.54 . . . . .	4.21 . . . . .	4.07
1899 . . . . .	1.53 . . . . .	4.24 . . . . .	4.07
1900 . . . . .	2.08 . . . . .	3.24 . . . . .	3.66
1901 . . . . .	2.15 . . . . .	4.09 . . . . .	. . .
1902 . . . . .	1.56 . . . . .	4.00 . . . . .	3.80
Average . . . . .	1.59 . . . . .	4.39 . . . . .	4.08

price of iron. It is evident that in 1900 the coke prices rose disproportionately high with respect to iron. The iron contracts had been made largely on the ground of a lower price.<sup>1</sup>

The relation of coke to coal is to be judged rather

<sup>1</sup> Enquete p. 641.

differently; coke shows in general a steady improvement with respect to coal, but this did not come from any depression in the price of coal. The relation, on the whole, was fairly constant, and, considering that it takes about 1.43 tons of coal to make a ton of coke in the Ruhr, it is not surprising that the price advance is about half as high again. For further analysis of the coal and coke prices with respect to the principal consuming industries the following prices are quoted:

	1899 <sup>1</sup>	1900 <sup>1</sup>	Mid year. <sup>1</sup> 1901	July. <sup>2</sup> 1903
Bar iron . . .	138 . . .	215 . . .	120 . . .	120
Steel rails . . .	125 . . .	155 . . .	110 . . .	120
Girders (Saar) .	105 . . .	117 . . .	110 . . .	{ 112.50 to 115
Rods . . . . .	125 . . .	185 . . .	130 . . .	{ 120 to 122.50
Drawn wire . . .	138 . . .	195 . . .	145 . . .	{ 130 to 137.50
Boiler plate Ia. .	143 . . .	212 . . .	180 . . .	150

Comparing these prices with those of coal (Fettförderkohle) and coke (blast furnace), we have the following price ratios. The yearly averages, also, show what

Ratio of price of	1899		1900		Mid year 1901		July 1903		Average	
	Coal	Coke	Coal	Coke	Coal	Coke	Coal	Coke		
Bar iron . . . . .	14.7	9.6	20.9	10.1	11.7	5.5	13.3	8.0	15.1	8.3
Rails . . . . .	13.3	8.7	15.1	7.2	10.7	5.0	13.3	8.0	13.1	7.2
Girders (Saar) . .	11.2	7.3	11.4	5.5	10.7	5.0	12.6	7.6	11.5	6.4
Rods . . . . .	13.3	8.7	18.0	8.7	12.7	5.9	13.5	8.1	14.4	7.9
Drawn wire . . . .	15.4	10.1	19.0	9.1	14.1	6.6	14.9	8.9	15.9	8.7
Boiler plate . . . .	15.3	9.9	20.7	9.9	17.5	8.2	16.6	10.0	17.5	9.5
Average . . . . .	13.9	9.1	17.5	9.1	12.9	6.0	16.0	8.4	14.6	8.0

a heavy cost the coal and coke constituted in 1901, especially the coke. According to the calculations of the Abrechnungsstelle für die Ausfuhr (see p. 223), it seems, that in the production of one ton of rails, 0.6 tons of coal and 1.35 tons of coke are consumed; for bar iron, 0.9

<sup>1</sup> *Düsseldorf Hk.*, 1901, I, p. 17; <sup>2</sup> *Kölnische Ztg.*, July 7, 1903.



tons of coal and 1.4 tons of coke ; for girders, 0.6 tons of coal and 1.35 tons of coke ; for rods, 0.9 tons of coal and 1.4 tons of coke ; for drawn wire, 1.35 tons of coal and 1.5 tons of coke.<sup>1</sup> Calculating the costs of coal and coke consumed per ton for rails, we have the following table :

Year.	Price of Rails.	Coal.	Coke.	Total fuel.	% of price of rails.
	m.	m.	m.	m.	
1899 . . .	125 . .	5.62 . .	19.39 . .	25.01 . .	20.0
1900 . . .	155 . .	6.15 . .	28.74 . .	34.89 . .	22.5
1901 . . .	110 . .	6.15 . .	29.70 . .	35.85 . .	32.6
1902 . . .	120 . .	5.76 . .	20.25 . .	26.01 . .	21.7

This shows in a clearer manner the effect of the rise in the price of coal and coke ; the year 1901 is again the crucial year.

Having some of the essential facts about the course of prices and their relation to the industrial situation, we are in a better position to consider the various opinions expressed about them. Complaints against the high price of coal on the part of the iron industry are not new. They naturally make themselves heard at every period of high prices, and so it was in the *hausse* of 1889-91.<sup>2</sup> They were much louder in the *hausse* of 1899-1901, and this was due, perhaps, to the recognition of the fact that it was a more or less organized and controllable movement. As a consequence, all sorts of legislative proposals were made, the Prussian Government had an inquest by a commission, and, finally, the Cartell Enquete now in progress may be attributed chiefly to the coal combination. Denunciations from industrial or private consumers are not to be accepted as wholly impartial criticisms, and, as they have the practical object, generally, of bringing about a

<sup>1</sup> Cf. Raffalovich, pp. 25-26.

<sup>2</sup> Bochum *Hk.*, 1891, p. 8.

price reduction, they are not wholly disinterested. Exaggerated vigor is a necessary characteristic of such complaints. Equally unreliable, *prima facie*, are the bald assertions of the other side. The situation is made more confusing by the conflicting testimony on both sides; some consumers protest that they are well pleased with the price policy of the syndicates,<sup>1</sup> while some of the coal magnates regret the lack of moderation shown by members of their industry.<sup>2</sup> A few details of these complaints and justifications, where they deal with tangible facts, may be adduced. A representative of large iron interests in Silesia, Herr Caro, declared that for his company (Oberschlesischen Eisenindustrie A. G.) the advance in the cost of coal between 1895 and 1901 was equivalent to a dividend on the shares of the company of 6.58%.<sup>3</sup> The course of dividends of his company do not show, however, that it was the coal price so much as the slump in the iron market that hurt their business.<sup>4</sup> The claim that the price of industrial coal was too high in Silesia, was indignantly rejected by (Generaldirektor Junghann Königs- und Laurahütte) who said that he, had offered Herr Caro coal, such as the Laurahütte used for Puddeleisen, for 2.00 m., which was refused; that the prices of coal in Upper Silesia were the cheapest in the world; and the cause of the bad situation of the iron industry lay elsewhere, because the Laurahütte, with its own coal, could not make a profit on rolled

<sup>1</sup> Enquete, p. 142, (Roheisen) p. 193, (Kleineisen) p. 199, (Maschinen) p. 501, (Kalk).

<sup>2</sup> Cf. especially Kirdorf, *Cent. Verb. D. I.*, 1901, p. 235.

<sup>3</sup> Enquete, p. 465.

<sup>4</sup> From 1895-96 to 1902-3 the course of dividends was 2%, —, 9%, 10%, 13%, 10%, 2%, and 0%. Enquete, p. 481.

iron or small iron wares<sup>1</sup>. Nevertheless in Silesia, as in Westphalia, it was claimed that a distinction could be made generally between the more prosperous and the less prosperous iron industries according as they engaged in the manufacture of the raw material or not, and, also, according as they provided their own coal. That is, the so-called "pure rolling mills" and those engaged principally in the higher manufactures were in both cases at a disadvantage as compared with those that had their own blast-furnaces and engaged principally in the manufacture of raw iron.<sup>2</sup> The iron interests, of course, generally demanded a reduction in prices, especially the "pure rolling mills,"<sup>3</sup> but it was strenuously objected that this would injure the prosperity of the coal industry without improving the iron industry; that is, that the situation in the iron industry was one of over-production and reckless competition, and, therefore, any concession made in the price of coal would be immediately followed by further underbidding in the sale of iron.<sup>4</sup> Under the conditions that prevailed in 1901 and 1902, it is very doubtful if a substantial reduction in the price of coal would have materially increased the industrial consumption.<sup>5</sup> M. Perquel, writing in 1900, asserted that

<sup>1</sup> Enquete, pp. 484-5.

<sup>2</sup> *Id.*, p. 174.

<sup>3</sup> *Id.*, pp. 166-67, 173-6, 197-8, etc.

<sup>4</sup> *Id.*, pp. 176, 471, 484, 590. Herr Kirdorf says that, if the prices had been lowered considerably, "the crisis would have been made much severer." Herr Junghann says that the low prices of iron in Germany are the result of the over-competition of the German iron-producers. Cf. Tschierschky, pp. 123-4. The suggestion of this danger was made by the Bochum Handelskammer in 1898; see *Be-richt*, 1897, p. 55.

<sup>5</sup> Cf. Liefmann, *Schutzzoll*, pp. 19, 67. A scheme to prevent a lack of correspondence between coal and iron prices is the familiar device of the sliding scale. This is used by the Eschweiler Bgw. in selling coke to iron producers. Cf. *Frankfurter Ztg.* Oct. 17, 1903.

there was no metallurgical overproduction.<sup>1</sup> As a matter of fact, this proved to be the case on a very large scale, and was one of the most difficult features of the crisis. The more strongly organized industries, such as coal, coke and raw iron, were able to ride through the storm better than the manufacturers of finished goods, because they not only could limit their output and maintain prices, at least to a certain extent, in the domestic market, but also they were able to develop exports, without resorting to reckless competition among themselves. The lack of union was recognized by the unorganized interests as one of the chief causes of the trouble.<sup>2</sup> In the case of the Westphalian small iron ware industry, this appears to have been partly due to the difficulty of establishing a cartell among such a great number of producers.<sup>3</sup>

One of the weakest points of the very intricate tangle of the steel industry was the fact that the strong Halbzeugverband was not cartelled with respect to exports. This resulted in cut-throat competition among its members for that part of the business.<sup>4</sup> The pure rolling mills were injured the most by this. The Baroper Walzwerk A. G. complains, in its annual report for 1902, that the Halbzeugverband sold so cheap abroad that the foreign rolling mills were given an advantage, not only in their local market, but also in the German market, in spite of the import taxes. The export bounties were declared insufficient. Further, the manufacture of finished products by the Halbzeug producers, in the face of the high prices they charged the

<sup>1</sup> Perquel, p. 31.

<sup>2</sup> Enquete, p. 470.

<sup>3</sup> *Id.*, p. 197.

<sup>4</sup> *Allgem. Ztg.*, 22 Nov., 1902.

rolling mills which were their customers for the half-products, put the pure rolling mills at a still greater disadvantage.<sup>1</sup>

When the ground of general expert testimony is left in the search of statistical proof of the allegations in respect to the iron situation, the material obtainable does not afford an entirely satisfactory basis for induction.<sup>2</sup> Nevertheless, the facts in the tables given below are probably fairly characteristic. The following groups may be distinguished in the iron business. (a) Blast furnaces and iron works possessing non-syndicate or independent coal mines; (b) blast furnaces and iron works possessing syndicate coal mines (for which the coal must be accounted for at syndicate prices); (c) blast furnaces and iron works which possess no coal mines (these are in a similar position to the second group, as respects prices, they have, however, less control over their supply); (d) "pure rolling mills", *i. e.*, those that have to buy iron as well as coal and coke; (e) machines and small wares. The point which requires attention, of course, is simply this,—has the undisputed profitableness of the coal industry been obtained at the expense of the iron industry, or is the iron industry unprofitable even with cheap coal? If the works in group (a) show an equal decline in profits with those of (b) and (c), we may conclude that the malady lies in the iron prices, rather than coal prices.

<sup>1</sup> Cited in *Allgem. Ztg.*, Nov. 5, 1902.

<sup>2</sup> A great deal of information respecting the situation of the iron industry has been developed in the Enquete concerning the same, the proceedings of which were published after the present writing was in the hands of the publishers. Nothing contained therein, however, has seemed to call for a modification of the views expressed here concerning its relations to the coal industry. Cf. *Kontradiktorische Verhandlungen über Deutsche Kartelle*, Hefte 5 u. 6.

If, further, the declines in groups (d) and (e) could be shown to be greater than for (c), the conclusion would be still stronger that the trouble was with the iron industry,—in this last case either with the high prices of raw iron or the low prices of the finished product. The readiest and most obvious means of comparison is the course of the stock quotations and the dividends paid. The quotation of stock, however, is an uncertain gauge of the current course of profits, on account of the fact that it stands for the future as well as the present, to say nothing of the variations caused by panic, stock manipulation, new emissions and the general state of the investment and money markets. Dividends, on the other hand, do not tell the whole story, because the policies of different companies vary greatly in respect to writing off depreciation, accumulating reserves, etc. The actual gross and net receipts show the situation from another standpoint, though here, too, the criteria are by no means sufficient to form a conclusive judgment of the whole situation. One great difficulty is that the accounts are not kept uniformly. Further, the interest obligations vary in their proportions to capital, and the necessities for writing off depreciation vary according to the character of the equipment, etc. In spite of these very important shortcomings, the following tables throw some light on the actual situation which may serve as a check on undocumented opinion or non-statistical testimony. The first part of the table covers the German iron industry of the northwest, the second, Silesian industry.<sup>1</sup>

<sup>1</sup>The data are taken, with a few exceptions, from abstracts of annual reports appearing in the *Allgemeine Zig.* and the *Frankfurter Zig.*

	1898-1899					1899-1900					1900-1901					1901-1902					1902-1903				
	Gross	D'pre	Net	Div.		Gross	D'pre	Net	Div.		Gross	D'pre	Net	Div.		Gross	D'pre	Net	Div.		Gross	D'pre	Net	Div.	
<i>Non-Syndicate. (a)</i>																									
Phönix	5940	2077	3549	11		8632	3097	5079	15		4185	2524	1319	4		3695	2544	604	0		5487	2527	3540	8	
Dortmunder Union	6848	2503	2571	6*		10075	3079	4335	7*		6033	3073	172	0*		2706	5457	-6700	0*		6668	2772	1271	2*	
Hörder	9023	2885	4797	14		9489	3062	4660	14		7861	2208	3169	10		4229	2048	---	0		6187	2600	1588	4	
Eschweiler	3781	1200	2570	15		4899	1440	3459	20		5753	2000	3553	20		4821	2000	2821	16		4295	1800	2495	14	
<i>Purt Syndicate.</i>																									
Bochumer Guss.	6240	1999	4240	16%		6267	1681	4586	16%		6345	2036	4308	13%		3684	1579	2105	7		3644	1589	2054	7	
Gutehoffnungshütte	7708	1750	---	---		10569	4300	---	---		9385	4400	3344	---		9029	3600	3599	20		---	---	---	---	
<i>Syndicate. (b)</i>																									
Schalker	3451	650	2801	42%		4834	665	4183	75		4533	865	3668	32%		6237	2147	4137	30		6346	2500	3969	32%	
Hoersch	---	---	---	---		6179	2621	---	16		4048	2398	1649	10		2646	2323	322	0		---	---	---	---	
Amnetz-Friede.	---	---	---	---		---	---	---	---		761	---	---	0		2537	1382	477	0		---	---	---	---	
Rheinisch Stahl	1586	502	1059	16		2316	515	1801	16		4630	1835	2794	10		3292	1847	1301	5		4050	1798	2248	8	
<i>No coal. (c)</i>																									
Rombacher	1960	---	944	15		2844	---	1713	20		5657	1640	1743	10		5053	1747	1425	5		---	---	---	---	
Westfal. Stahl	---	---	458	1262	17	---	---	525	1337	17	1724	664	450	0		953	385	0	0		---	---	---	---	
Friedrichshütte	466	113	399	10		579	133	402	13		1082	53	766	14		789	206	553	10		405	203	167	4	
Georg Marien	3709	744	---	10		3873	689	---	10		2652	708	779	4		2535	773	447	1/2		---	---	---	---	
<i>Pure rolling mill. (d)</i>																									
Westfal. Draht	---	---	1079	11		---	---	2479	15		1737	716	1189	10		1671	258	1054	9		---	---	---	---	
<i>Machine and small iron. (e)</i>																									
Armaturen u. Masch.	685	214	476	8		664	275	389	6 1/2		227	213	141	0		136	202	-324	0		-309	186	-495	0	
Maschinen. Karlsruhe	891	51	414	15		1051	44	480	15		1083	31	555	15		900	24	456	12 1/2		844	21	427	12 1/2	
Maschinen. Augsburg	---	---	---	---		---	---	---	---		2685	---	1992	---		1970	---	1452	---		---	---	---	---	
Düsseldorf. Bedarf	---	---	---	---		---	---	---	---		616	42	359	16		573	43	294	12		---	---	---	---	
Hannover Maschin.	---	---	---	---		---	---	---	---		---	500	1919	28		---	500	1241	20		---	---	---	---	
Maschinen. Deutschl.	---	---	---	---		---	---	---	---		335	77	287	14		118	52	106	6		---	---	---	---	
<i>SILESIA—Coal. (a)</i>																									
Laurahütte	8910	3507	4631	15		10660	4500	5256	16		9691	4000	4830	14		7446	3018	3345	10		8281	3508	3679	11	
Kattowitz	---	---	---	12		---	---	---	14		4938	1650	---	14		4826	1650	---	12		---	---	---	---	
Oberschles. Bedarf	---	---	---	7		---	---	---	9		4201	1997	2150	9		766	650	---	2 1/2		---	---	---	---	
<i>No coal. (b)</i>																									
Huldshinsky	3183	400	2731	12		3536	600	2683	12		1844	650	891	4		1039	650	116	0		1495	650	665	3	
Oberschles. Eisenind.	---	---	---	10		---	---	---	13		4659	1750	2439	10		2451	1250	605	2		---	---	---	---	

\* Lit. C.

It is rather remarkable that among the iron works that possess an independent supply of coal there should be one in difficulties requiring a "Sanierung" (Dortmunder Union) and another which seems barely able to get along. There have been a couple of blast furnace concerns owning syndicate coal mines in a similar position (Hoesch and Deutsche-Luxemburgische A. G.),<sup>1</sup> but there are also some that have done very well (*viz.*, Schalker and Rheinische Stahlwerk), while those that have no coal supply, or none worth mentioning, either in the syndicate or out of it, seem to have done the best of all. This seems to be a point against the claim that the weakness of the iron industry was the consequence of high coal prices.<sup>2</sup> In the following table we have the dividends (D) and stock quotations (Q) of the principal iron producers.<sup>3</sup> (See next two pages).

A comparison of the dividends and quotations of the dark years 1894 and 1901 show a higher average rate of interest for the latter. In the former period, the price of coal and coke was very low, but the iron industry remained unprofitable. So far as this analysis goes, it seems to show that high coal prices or low coal prices have not made a very great difference in the profit of the iron industry, but, of course, a difference of a small amount seems of considerable importance in hard times.

Complaints came from other industries also of the

<sup>1</sup>The affairs of the latter before its successful reorganization by the Bank f. Handel u. Industrie are too complicated to appear in the table.

<sup>2</sup>It seems to cast some doubt, also, on the extent of the advantages of combinations of successive stages of industry (Combinierter Betrieb); cf. Sombart, I, p. 554; Sinzheimer, p. 20; Calwer, 1901, p. 267; Enquete, p. 675.

<sup>3</sup>Data are from Saling's *Börsen Papiere*, 1903-4.



	1889.		1890.		1891.		1892.		1893.		1894.		1895.		
	D.	Q.	D.	Q.	D.	Q.	D.	Q.	D.	Q.	D.	Q.	D.	Q.	
(a)															
Hörder St. A. ....	0	---	0	---	0	---	0	---	0	---	0	---	0	---	Wholly or mostly non Syndicate.
" Vorz. A. ....	0	---	0	---	0	---	0	---	0	---	3	---	5	---	
" Lit. A. ....	4	137.25	2	84.50	1	55.20	1	54.10	0	56.30	0	58.50	0	53	
" Lit. C. ....	10	287.90	6½	160	6½	117.50	3½	118.40	4½	128.10	5	140.60	5	149.40	
Bochumer Guss. ....															
(b)															
Hoesch ....	---	---	5	---	5	---	5	---	5	---	7½	---	7½	---	Syndicate.
Schalker ....	---	132.50	6	111.25	10	85.50	9	109.25	9	113.60	7½	140.80	15	146.75	
Rhein. Stahl ....	13½	201.20	11	164.50	10	137.50	8	146	10	137	10	154.90	11	176	
(c and d)															
Friedrichshütte. ....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Westfäl. Stahl ....	---	---	---	---	0	---	6	---	12½	---	12	154.60	13½	176	
Rombacher ....	0	---	0	---	0	---	5	---	6	---	7	---	8	---	
Georg Marien ....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Geleank. Guss. ....	10	---	10	121	4	94.75	0	68.75	2	60.50	2	70	4	81.80	
Wittener Guss. ....	13½	173.50	10	141.25	10	115	5½	117	6½	113.75	6½	123	7½	141.50	
Hagener Guss. ....	10	153.50	8	141.50	6½	116.25	2½	106.30	4	94.75	6	93.10	4½	111.75	
Geisweiler ....	---	---	---	---	---	---	---	---	0	---	0	---	7	---	No coal or practically none.
Hasper Eisen u. S. ....	---	---	---	---	---	---	---	---	---	---	---	---	0	---	
Lothringer E. St. A. ....	0	---	0	---	0	---	0	---	0	---	0	---	0	---	
Pr. A. ....	6	---	4	---	1	---	1	---	3	---	3	---	5	---	
Rhein. Bg. u. H. ....	0	---	8	---	2	---	6	---	12½	---	12	154.60	13½	176	
Wiessener Bgw. ....	---	---	---	---	---	---	---	---	6	---	6	---	6	---	
Charlottenhütte ....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Donnersmark ....	4	126.25	8	111	6	81.50	6	81.50	6	94.50	6	116	8	143.70	(Coal.)
Kattowitzer ....	10	142	10	128.25	8	122.75	8	109	8	129.60	8	138	8	154	"
Laura ....	11	173.25	8	139	4	105	3	90.90	4	112	4	121.75	8	142	(No coal.)
Huldchinsky ....	---	---	---	---	---	---	---	---	---	---	11	---	15	---	"
Bismarck ....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Oberachl. Bedarf ....	6	121.75	5	91.90	2	53	¾	40.52	2½	76.40	3	71.75	¾	91.60	(Coal.)
Obernchl. Eisen ....	14	216.75	11	174	6	124.50	4½	101.50	3½	100.25	2	82	2	95	(No coal.)

	1896.		1897.		1898.		1899.		1900.		1901.		1902.		
	D.	Q.	D.	Q.	D.	Q.	D.	Q.	D.	Q.	D.	Q.	D.	Q.	
(a)															
Hörder St. A.	0	---	2	---	9	---	9	---	5	---	0	---	---	---	Wholly or mostly non-Syndicate.
" Vorz. A.	8	---	11	---	14	---	14	---	10	---	0	---	---	---	
Union Lit. A.	---	49.90	---	48.50	---	---	---	---	---	---	---	---	---	---	
" Lit. C.	5	102.25	5	98.10	6	98.50	7	133.25	0	82.20	0	42.30	---	---	
Bochumer Guss.	12	166.50	15	204.75	16½	229	16½	260.30	13½	175.30	7	174	---	179.10	
(b)															
Hoesch.	12	193	12	180.25	15	187.25	16	217.75	10	156.50	0	138.50	---	145.10	Syndicate.
Schalker	22½	228.90	30	286.90	42½	353	75	588	32½	315	30	286	---	345	
Rhein. Stahl.	15	191.50	15	203.75	16	217.25	16	223	10	158.50	5	138.50	---	140	
(c and d)															
Friedrichshütte	10	---	10	---	10	---	13	---	14	141	10	126	---	135	No coal or practically none.
Westfäl. Stahl	15	192.90	15	200.50	17	208	17	229	0	152.75	0	114.80	---	122	
Rombacher	12	---	13	---	15	204.50	20	276.75	10	170	5	133.25	---	150.25	
Georg Marien	---	---	---	---	10	---	10	---	{ 5	---	{ 5	---	---	---	
Gelsenk. Guss.	8	116.10	12	163.70	14	188.60	12	207.25	4	126	0	87	---	99	
Wittener Guss.	10	150	16	181.50	18	232	20	259	12	171.50	7	151	---	153	
Hagener Guss.	6½	113	6½	129.50	6	134.50	6	125	0	81.75	0	55.75	---	34.75	
Gefweider	14	---	14	158	20	196	25	316.25	12	190.25	0	144.75	---	142.50	
Hasper Eisen u. S.	10	---	10	105	22½	249.50	30	364.50	0	196	2	127.50	---	148	
Lothringer E. St. A.	0	27.25	0	27.50	0	24.75	1	47.25	0	31.10	0	23	---	27.90	
Pr. A.	2¼	---	3	---	5	---	6	---	1½	---	0	---	---	---	
Rhein. Bg. u. H.	8	139	10	154.50	10	141.50	10	166.70	12	132.75	0	95	---	98.50	
Wiesener Bgw.	15	192.90	15	200.50	17	208	17	229	0	152.75	0	114.80	---	122	
Charlottenhütte	22½	---	12	---	12	148.75	0	180.25	0	---	0	77.75	---	76.30	(Coal.)
Donnersmarck	9	160.25	10	164.80	12	191.80	15	230	16	212.75	14	191.75	---	210.10	"
Kattowitzer	10	161.75	12	175.60	12	190.50	14	223.60	16	188.50	12	180.30	---	201	"
Laura	10	163.80	13½	184.40	15	217	16	253.50	14	194.30	10	185.80	---	211.75	(No coal.)
Huldchinsky	15	---	12	---	12	163	12	161.75	4	120	0	86	---	101.25	"
Bismarck	---	---	15	210.80	19	212.25	24	316.50	12	230	10	192	---	220	(Coal.)
Oberachl. Bedarf	5	108.90	6½	118.25	7	130.50	9	127.90	9	99.90	3	105.50	---	2½	(No coal.)
Obernchl. Eisen	8	132	9	133.90	10	153.90	13	184	10	121.30	2	100.20	---	91.90	

high price of coal, but, as in the iron industry, the testimony is conflicting. In the case of many of them the coal consumption is such an unimportant factor that they may be passed over with the briefest mention. This is the case, for example, with the textile industry and sugar manufacture.<sup>1</sup>

It is otherwise with cement and lime, which not only consume tolerably large quantities, but for which the cost of coal forms a very important item in the cost of production. A representative of the cement industry declared that on account of the excessive competition in northwestern Germany, no reduction of coal prices would have availed.<sup>2</sup> The representative of the cement industry of Upper Silesia expressed satisfaction, on the whole, with the price policy of the convention.<sup>3</sup> For the lime industry (in which 30 tons of coal are required for every 100 tons of lime produced) the representative of the Upper Silesian producers, asked for price reductions.<sup>4</sup> The inland navigation interests are also important consumers of coal. Herr Gothein (a persistent opponent of cartells) declared that the high coal prices had greatly injured the navigation interests of the Oder.<sup>5</sup> Another representative of the Oder ship-

<sup>1</sup> Cf. for textiles, Enquete, pp. 496, 498; *Aachen Hk.*, 1900, p. 103; *Industrie Ztg.*, 1901, p. 270, (meeting of the Verband der Textilen Industriellen von Chemnitz); Tschierschky, pp. 123-4; and for sugar, Enquete, pp. 408, 410, 412; *Oppeln Hk.*, 1900, p. 37.

<sup>2</sup> Enquete, p. 123.

<sup>3</sup> *Id.*, p. 502. For the 18 to 20 concerns listed on the Berlin Börse the average dividends were 1897: 11.4%, 1898: 14.0%, 1899: 15.6%, 1900: 11.2%, 1901: 3.3%. (Compiled from *Allgemeine Ztg.*, June 22, 1902). It is evident that the great prosperity of the industry developed under high coal prices, and the decline came before they had reached their maximum.

<sup>4</sup> *Id.*, p. 501.

<sup>5</sup> *Id.*, p. 515.

ping (of the fleet of the coal dealer Friedländer) declared that the unprofitableness of the business was not due to the price of coal, but to the bad conditions of navigation.<sup>1</sup> The attitude of the great ocean shipping firms is interesting, especially from the fact that they are not dependent on German coal. Direktor Bremermann, of the Norddeutsche Lloyd testified that they have naturally had rather pleasant relations with the German coal producers, but that, nevertheless, they have decided to acquire their own mines, in order, first, to assure themselves of just the right sort of coal, and, secondly, to make themselves independent of the combinations.<sup>2</sup>

The relations of the railways (which are owned almost entirely by the states) with the coal producers do not need particular discussion. In Saxony, as well as in Prussia, there are fiscal coal mines.<sup>3</sup> The railways have an ample means of self defense against extortion through their control of the railway rates. The Prussian government buys a large part of its locomotive coal, and is able to get favorable prices from the syndicate.<sup>4</sup>

The fact that the Prussian government is a coal producer, as well as a coal consumer, rather complicates its policy. At the time of the foundation of the syndicate, a price advance of .50 m. (to 8.50) was agreed to by the government in its contract for locomotive coal. This caused a considerable outcry, but a spokesman of the coal interests (Dr. Reismann) pointed out

<sup>1</sup> Enquete, p. 517.

<sup>2</sup> *Id.*, p. 505.

<sup>3</sup> *Jahrb. f. d. Bergbau u. Hüttenwesen im Königr. Sachsen*, 1902, p. 9.

<sup>4</sup> *Cf. Zeitung d. Vereins Deutscher Eisenbahn-Verwaltungen*, 1900, p. 21.

that, though this meant an extra expense of  $1\frac{3}{4}$  millions on the 3,500,000 tons purchased, yet, when the same advance was followed by the fiscal works on over ten million tons production, the state would gain 3,325,000 m.<sup>1</sup>

The imperial marine has no mining interests to take account of, and it buys its coal where it is cheapest. In 1892, we find the Ruhr producers complaining that English coal is taken instead of German.<sup>2</sup> The former was four or five marks cheaper at the place of delivery. In 1900, during the coal famine, the XVIII army corps bought English coal.<sup>3</sup>

Most important of all, perhaps, in the consumption of coal, is the general consumption for cooking and house-heating. Especially in an industrial country which competes in the world market, an enhancement of the cost of living must be extremely injurious. High prices of coal have unquestionably a peculiarly bad effect on the individual, the injuries resulting from excessive economies in this direction being as insidious as they are serious. Dear coal may be likened to dear bread or meat, in contradistinction to dear sugar or spirits. The general consumer, moreover, is peculiarly unfitted to cope with extortionate price advances in this commodity, and his activity is aroused rather to secure the necessary quantity than to obtain it at a reasonable price. Whether abuse exists in this quarter or not is a more difficult question, and it may be said that it can only be approached successfully from the second criterion of price policy, namely, profits—any price policy, that is, which leads to an inordinate profit must be highly prejudicial to the general consumer.

<sup>1</sup> Cf. Effertz, (1894), p. 6.

<sup>2</sup> *Dortmund Hk.*, 1892, p. 12.

<sup>3</sup> Reichstag, 1900, p. 277.

# CHAPTER VII.

## PROCEEDS AND PROFITS.

The second criterion for judging the reasonableness of coal prices is cost and profit. We have already analyzed the situation with respect to costs, it now remains to compare costs with proceeds and to determine

### PROCEEDS PER TON.

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Aplerbecker	---	10.33	10.61	8.90	7.51	7.56	7.45	7.61	8.04	7.98	8.17
Beakermühle	5.67	8.54	8.73	7.33	6.94	6.71	6.59	6.79	7.60	8.11	8.56
Bickfeld	7.64	10.33	10.69	8.79	7.55	8.09	8.62	8.97	9.39	9.17	9.58
Bochumer Bgw.	---	---	---	---	6.83	7.20	6.94	7.34	7.90	8.32	8.57
Borusia	---	---	---	---	---	---	6.61	6.42	6.90	7.38	8.12
Concordia	---	---	---	---	---	7.59	7.72	8.01	8.06	8.37	8.92
Dahlbusch	6.43	9.84	10.00	8.71	7.42	7.72	8.17	8.11	8.38	8.49	9.05
Dahlhauser	6.23	8.93	10.30	8.30	7.94	6.90	7.55	7.47	8.20	8.56	9.09
Dannenbaum	5.55	8.45	9.76	9.10	7.31	6.87	7.08	7.33	7.45	8.06	8.44
Dorstfeld	5.99	8.76	9.31	8.19	6.92	7.30	7.53	7.75	8.27	8.54	9.26
Louise Tiefb.	---	---	---	---	7.24	7.46	7.61	8.12	8.25	8.42	9.30
Bruchstrasse	---	---	---	---	7.66	8.89	8.42	8.48	8.32	8.41	9.16
Eiberg	6.65	9.01	9.92	8.54	7.58	7.27	7.59	7.67	8.15	8.07	8.67
Eintracht	---	---	---	---	---	---	7.55	7.73	8.00	8.35	8.66
Ewald	7.47	11.19	11.10	9.94	8.63	8.59	8.53	8.56	8.62	8.71	9.16
Friedl. Nachb.	6.57	9.29	9.77	7.97	6.79	7.15	7.37	7.69	8.23	8.37	9.30
Friedr. Ernest.	5.91	8.48	8.76	8.34	7.73	8.26	8.29	8.14	8.48	8.74	9.30
Gelsenkirchen	8.89	---	---	---	---	7.03	7.30	7.43	8.01	8.51	8.89
Graf Beust	---	---	---	---	---	---	7.71	8.12	8.24	8.45	8.98
Graf Bismarck	6.72	9.80	11.08	9.78	8.46	8.73	8.70	8.59	8.78	8.90	9.43
Graf Schwerin	---	---	---	---	---	---	7.88	7.93	7.84	8.67	8.98
Harpenier	---	---	9.77	7.88	7.43	7.89	7.94	8.09	8.37	8.64	9.52
Heinrich	6.94	9.42	9.46	8.67	7.34	7.29	7.67	7.96	7.96	7.92	8.44
Helene Amalia	---	---	---	---	8.47	8.24	8.78	9.53	10.87	12.69	13.06
Hercules	6.10	11.65	12.64	10.32	9.43	8.24	7.97	7.91	8.08	8.57	9.01
Joh. Deimelsb.	---	---	---	---	---	---	7.60	8.02	8.98	8.43	9.77
Jul. Phillip	---	---	---	---	---	---	6.00	6.69	7.64	8.08	8.83
König Ludwig	6.38	9.03	9.20	8.74	7.52	7.76	8.13	7.92	8.76	8.87	9.74

profits. There are three ways open to approach this question ; first, to compare costs per ton and proceeds per ton ; second, to get the actual profit ; third, to get the dividends and quotations of stock. The Dortmunder Jahrbuch for 1901 contains data from which the foregoing and following statistics concerning the proceeds of the

PROCEEDS PER TON—CONTINUED.

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Königsborn	6.06	8.48	8.13	7.27	6.05	6.20	6.36	6.70	7.37	8.07	8.33
Langenbrahm	---	---	---	---	---	---	9.71	9.96	10.68	10.80	10.49
Lothringen	7.05	11.69	10.89	8.52	5.57	7.40	7.44	7.62	8.12	8.60	9.23
Magdeburg	---	---	---	---	---	---	---	8.60	8.86	8.97	9.49
Mansfeld	---	---	---	---	---	7.51	7.60	7.75	8.16	8.61	8.77
Mark	8.29	9.67	8.66	7.12	6.58	6.90	6.96	7.38	7.62	7.77	8.44
Massen	6.23	9.43	8.19	7.41	6.56	7.04	7.37	7.74	8.20	8.61	8.84
Mont Cenis	---	---	---	---	7.25	7.73	7.71	7.94	8.00	8.45	9.32
Rosenblumendelle	---	---	---	---	---	5.91	6.35	6.66	7.11	7.21	8.08
Portingsiepen	8.16	10.82	11.51	11.24	7.65	8.69	8.99	9.37	9.79	10.61	10.92
Preuss. Clus	10.68	12.27	12.34	11.78	10.82	10.85	11.04	10.93	10.75	10.97	11.27
Prinz Friedr.	3.54	5.63	6.68	6.08	5.12	5.27	5.60	5.05	4.62	4.60	5.15
Rhein. Anthrac.	8.70	8.32	7.92	5.91	5.70	5.05	6.40	6.51	7.37	7.34	8.15
Richardt	5.55	7.16	7.31	6.27	5.68	5.83	5.23	5.53	6.10	6.29	6.48
Schür. and Charl.	6.45	8.98	8.74	7.57	7.09	7.29	7.08	7.45	7.88	7.84	8.26
Sieben Plaueten	7.25	9.80	9.75	8.40	7.80	7.75	8.40	8.00	7.71	8.58	8.95
Steingatt	5.75	7.84	9.06	9.16	8.70	8.39	8.50	8.95	9.67	9.96	10.16
Trappe	7.10	9.59	9.90	8.91	7.97	8.06	8.00	8.42	8.27	8.41	9.13
Tremonia	6.77	9.75	8.64	7.73	7.36	7.65	7.85	7.75	8.01	8.60	9.34
Caroline	7.55	10.01	10.73	8.66	7.64	7.36	7.35	7.47	8.36	8.35	8.68
Deutschland	---	---	---	---	---	7.44	7.44	7.72	8.03	8.25	8.45
Friedr. d. Gr.	---	---	---	---	---	---	8.11	7.98	8.29	8.39	9.21
Wiendahlsbank	---	---	---	---	6.49	6.37	7.09	7.81	7.92	8.09	8.99
Average	6.81	9.42	9.66	8.44	7.37	7.46	7.64	7.82	8.21	8.49	9.02

individual mines are compiled. Marked differences, it will be observed, exist between the average proceeds of the different mines; particularly low are Königsborn and Dannenbaum with 7.18 and 7.76, respectively, for the period given, while Portingssiepen and Preussische Clus with 9.80 and 11.25, respectively, are very high. The average annual proceeds obtained by the mines in this table cover a considerable part of the total output of the district (in 1899 about 45%), and may be taken as fairly representative. These figures cover the period from 1889 to 1899 inclusive. Official figures for the receipts of the syndicate are obtainable from 1894 to 1902 inclusive.<sup>1</sup> Taking the two together, we have a means of judging the proceeds from 1889 to 1902. The

	<i>Syndicate, proceeds per ton.</i>	<i>Mines tabulated above, proceeds per ton.</i>
1889 . . . . .	—	6.81
1890 . . . . .	—	9.41
1891 . . . . .	—	9.99
1892 . . . . .	—	8.44
1893 . . . . .	—	7.37
1894 . . . . .	7.83	7.46
1895 . . . . .	8.02	7.64
1896 . . . . .	8.14	7.82
1897 . . . . .	8.45	8.21
1898 . . . . .	8.62	8.49
1899 . . . . .	9.14	9.02
1900 . . . . .	10.56	—
1901 . . . . .	11.01	—
1902 . . . . .	10.30	—

correspondence between the two columns for the years in common is close enough to enable an approximate estimate to be made of the proceeds per ton for the whole district between 1889 and 1893.

Taking those mines for which we have also the sta-

<sup>1</sup> Enquete, p. 279.



tistics of annual average cost per ton (see pp. 154-155), we obtain the following table of average *net proceeds* per ton:

Of the mines given in this table only two worked any length of time below the margin of cost of produc-

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Aplerbecker	---	4.19	3.54	1.88	.36	-.56	.40	.61	.79	.84	.12
Bickfeld	.76	1.11	3.38	1.83	.60	1.18	1.23	.25	.86	.43	1.14
Concordia	---	---	---	---	---	1.41	1.45	2.51	2.24	2.06	2.24
Dahlbusch	---	---	4.46	2.85	1.72	2.08	2.34	2.26	2.24	2.07	2.08
Dalhäuser	1.14	2.89	3.65	1.43	.18	-.23	-.15	-4.28	-.52	-1.15	.57
Dannenbaum	-.08	2.20	3.54	3.19	1.55	.78	.92	1.08	.62	.34	.14
Dorstfeld	-.92	.85	1.26	---	-.47	.13	0	.75	1.08	.63	.59
Louise Tiefb.	---	---	---	---	1.59	2.15	2.03	2.33	1.54	1.25	2.13
Bruchstrasse	---	---	---	---	.38	.58	.79	.55	.22	-.03	.53
Elberg	1.60	3.49	3.24	2.05	1.47	1.38	1.52	1.33	1.46	1.40	1.70
Eintracht	---	---	---	---	---	---	1.34	1.69	.93	1.16	.98
Ewald	1.48	4.94	4.51	3.66	2.61	2.34	2.63	3.30	2.82	3.04	2.23
Friedl. Nachb.	-.36	1.37	1.12	.74	.58	-.30	.59	1.26	.07	-1.28	1.84
Gelsenkirchen	---	---	---	---	---	1.50	1.88	1.97	2.22	2.34	2.31
Graf Bismarck	---	---	---	---	---	2.88	3.19	2.92	2.52	2.29	2.57
Graf Schwerin	1.32	3.79	4.99	3.86	2.53	---	1.24	1.07	.30	1.33	1.33
Harpener	---	---	3.52	2.21	1.81	2.19	2.14	2.35	2.29	2.15	2.19
Heinrich	1.67	3.68	4.17	2.25	1.15	1.23	1.79	1.28	.40	.36	.70
Joh. Deimelsb.	---	---	---	---	---	---	1.51	1.71	1.95	1.34	1.49
Jul. Phillip	0	---	---	---	---	---	-.68	-.18	.81	.70	.28
König Ludwig	---	2.37	1.78	1.82	1.10	1.37	1.71	1.47	2.02	1.58	1.62
Langenbrahm	---	---	---	---	---	---	2.33	2.89	3.73	3.48	2.69
Magdeburg	---	---	---	---	---	---	---	3.00	2.94	2.80	3.15
Mansfeld	---	---	---	---	---	4.65	4.72	4.71	5.05	5.11	5.10
Mark	2.01	1.93	.92	.66	.48	1.01	1.00	1.21	1.25	.93	.60
Masden	-.91	2.16	1.35	.69	.25	.62	.64	.74	.63	1.14	1.11
Mt. Cenia	---	---	---	---	.67	1.53	1.30	1.27	1.36	2.01	2.68
Rosenblumendelle	---	---	---	---	---	---	---	-.05	-.54	-3.98	-3.25

tion (Deutschland and Dahlhauser); none of them worked continuously near it. The total annual average net proceeds per ton ranged from .71 to 2.86. The highest figure came in 1891 when the *hochconjunctur* had already passed by, but it must be remembered that

NET PROCEEDS PER TON—CONTINUED.

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Preuss. Clus	—2.04	1.78	1.72	.97	.58	.35	.56	.24	—58	—58	—21
Prinz Friedr.	—1.57	—1.44	2.06	.60	.10	.31	.46	.05	.37	—23	.81
Rhein. Anthr.	3.35	2.89	2.70	.88	.76	.06	1.48	1.86	2.36	1.37	2.19
Richardt	.81	2.32	2.40	1.41	1.22	.91	.73	1.30	1.57	1.77	1.43
Schür. and Charl.	.95	2.28	1.93	.80	.59	.49	.61	.90	1.36	.59	.59
Sieben Planeten	—	—	—	—	—	—	—	—	1.33	1.51	1.60
Steingatt	1.42	3.14	3.99	2.14	.57	.56	.18	.25	.51	.95	—14
Trappe	.88	3.03	3.69	2.95	1.67	1.08	1.91	2.40	2.25	2.09	2.20
Trenonia	—	.13	1.27	.83	.85	1.24	1.07	1.02	1.03	1.59	1.42
Caroline	.61	2.39	3.37	1.84	1.28	1.07	.30	.05	1.45	.99	.65
Deutschland	—	—	—	—	—	—	.31	—	.33	—2.37	1.11
Friedr. d. Gr.	—	—	—	—	—	—	.71	.61	1.22	1.04	.73
Wiendahlsbank	—	—	—	—	.68	.50	.63	.90	.09	—16	.39
Average	.71	2.34	2.86	1.73	.96	1.09	1.23	1.23	1.35	1.04	1.31

while current prices may conform to the market situation, the proceeds lag behind it about a year in the coal business, because the contracts are made for a year, and often sometime in advance of the beginning (April 1) of the term.<sup>1</sup>

If we take the official figures of cost of production for the *Dortmund district* (see p. 156), and subtract them from the actual proceeds per ton given by the *syndicate*, we have another approximate means of getting at the net proceeds per ton. The results here are

	<i>Syndicate proceeds p. t.</i>	<i>o. b. a. b. Dortmund cost p. t.</i>	<i>Approx. net proceeds p. t.</i>
1894-----	7.83	6.38	1.45
1895-----	8.02	6.66	1.36
1896-----	8.14	6.77	1.37
1897-----	8.45	7.04	1.41
1898-----	8.62	7.32	1.30
1899-----	9.14	7.66	1.48
1900-----	10.56	8.54	2.02
1901-----	11.01	8.77	2.24
1902-----	10.30	8.39	1.91

not greatly different for corresponding years from those given in the table of mines above (average difference equals .18 m.), but this table gives the net proceeds for three more years, 1900 to 1902, critical years of the *syndicate's* price history. The advance in net proceeds, in that period, was very marked, compared with the previous course, though the advance posi-

<sup>1</sup> The following table, compiled from the abstracts in the press of the annual reports of Harpener, connects with the facts given above for that mine the figures of the two following years :

	<i>Proceeds.</i>	<i>Cost.</i>	<i>Net proceeds.</i>
1899-1900 . . . .	9.52 . . . . .	7.33 . . . . .	2.19
1900-1901 . . . .	10.70 . . . . .	7.62 . . . . .	3.08
1901-1902 . . . .	10.29 . . . . .	7.61 . . . . .	2.68
1902-1903 . . . .	9.67 . . . . .	7.45 . . . . .	2.22

*Allgem. Zig.*, Oct. 18, 1900; Oct. 16, 1902; *Frankfurter Zig.*, Oct. 14, 1903.

tively was not so great as would be imagined—at the maximum about .75 per ton above the proceeds of 1899.<sup>1</sup>

Figures of net proceeds per ton do not convey any very definite idea of the profitableness of the business, unless we know the amount of capital per ton required to produce it. Graf Kanitz, in his well known *brochure* in 1891, declared that ten marks of share capital per ton was a reasonable estimate.<sup>2</sup> This estimate was very sharply attacked by Generaldirektor Effertz (Königsborn), who, on the basis of an elaborate statistical analysis<sup>3</sup> of about 80% of the coal output of the Ruhr between the years 1873 and 1890, found that the average capital invested per ton was 17.11 m. share capital and 2.90 m. bonds (or the equivalents for *Gewerkschaften*) giving a total capital investment of 20.09 m.<sup>4</sup> The maximum was 24.54 in 1874, and it diminished quite regularly down to 1890, when it was 18.14 m. The value of obligations per ton in 1890 was 3.11 m. and share capital, 14.99 (reductions of capital 0.04). Effertz uses this figure of 20.09 m. (average total capital per ton) to reckon the per cent. of profit for 1894, and finds it to be 4.18%. As there had been an almost perfectly steady decline in the amount of capital per ton output, it would have been more judicious in figuring on the year 1894 to have used the ratio of 1890 (the latest year) which was 18.14. The question also arises whether in calculating the profits of an industry the obligations should be included with the share capital. Effertz excludes

<sup>1</sup> Effertz calculates the net proceeds for 1894 at .84 m.; Effertz, 1895, p. 14.

<sup>2</sup> Kanitz, pp. 9-10.

<sup>3</sup> Effertz, 1891, p. 11.

<sup>4</sup> Including .07 m. for reduction in nominal amount of share capital.

them for the first semester of 1894 in his earlier pamphlet,<sup>1</sup> but he includes them in his calculation for the whole year 1894 in a later one.<sup>2</sup> The latter course is undoubtedly the more correct of the two.

If we examine the figures of share capital and obligations for 1902 for the mines given in the table on page 30, we have for 13 mines producing 22.1 millions tons (equal to about 38% of the total of the Ruhr) a total share capital of 252,700,000 m., and current obligations of 68,147,893 m.; a total of 320,847,893 m. Figured per ton, this is 11.43 m. of share capital, 3.08 m. of obligations; a total of 14.51 m. It is impossible here to take account of the important questions of repayment of obligations from earnings, writing off depreciation and accumulation of reserves, though these obviously are important in estimating the actual capital employed. In recent years, the policy of the mining companies has been very liberal in this respect, so that a larger amount of capital is employed than appears from the mere consideration of share capital and obligations. Assuming, however, as the least amount of capital that can come into consideration, 14.50 m. per ton for 1902, and taking Effertz's figure of 18.14 m. for 1890, we have a mean investment of capital per ton, between 1890 and 1902, of 16.32 m. Using this as a basis, we may calculate the per cent. of profit on the tables of net proceeds given above (pp. 250-1). The agreement in these two tables is not remarkably close, but is as close as could be reasonably expected. Both agree in putting the rate of profit, generally, considerably higher than Effertz's calculation for 1894.

<sup>1</sup> Effertz, 1894, p. 16. Graf Kanitz does not mention them.

<sup>2</sup> *Id.*, 1895, p. 13.

YEAR.	Table of Mines pages 250-1.		Syndicate.	
	Net proceeds per ton.	Estimated per ct. profit	Estimated net proceeds per ton.	Estimated per ct. profit
1889	.71	4.4	----	----
1890	2.34	14.4	----	----
1891	2.86	17.5	----	----
1892	1.73	10.6	----	----
1893	.96	5.9	----	----
1894	1.09	6.7	1.45	8.9
1895	1.23	7.5	1.36	8.3
1896	1.23	7.5	1.37	8.4
1897	1.35	8.3	1.41	8.7
1898	1.04	6.4	1.30	7.9
1899	1.31	8.0	1.48	9.0
1900	----	----	2.02	12.4
1901	----	----	2.24	13.7
1902	----	----	1.91	11.7

On the other hand, the sweeping assertion of Graf Kanitz that in 1890-91 the mines earned on an average a dividend of 45% appears as a wild exaggeration.<sup>1</sup> Of course, some mines made immense profits while others lost.<sup>2</sup>

The second method to get at the profits of the coal industry is to take the actually divided profit. The tables on the following pages (pp. 256-7) represent the situation fairly well.<sup>3</sup>

For the period from 1870 to 1888 inclusive, these mines averaged 6.9%; from 1875 to 1888, a period of thirteen years, the average was only 3.2%. Generaldirektor Effertz makes a calculation (covering from 74% to 84% of the total production of the region), according to which the dividends and divided profits from 1873 to 1890 inclusive were as follows:<sup>4</sup>

1873	1874	1875	1876	1877	1878	1879	1880	1881
18.2	12.2	4.5	2.1	1.5	1.5	1.6	2.8	2.3
1882	1883	1884	1885	1886	1887	1888	1889	1890
2.6	3.8	2.4	2.1	2.2	2.3	3.0	5.5	13.6

<sup>1</sup> Kanitz, p. 9.

<sup>2</sup> On this basis Harpener appears to have earned 13.4% in 1899, 18.9% in 1900, 16.4% in 1901 and 13.6 in 1902, see p. 250, note.

<sup>3</sup> Saling, 1903-4.

<sup>4</sup> Effertz, 1891, p. 12.

DIVIDENDS.<sup>1</sup>

	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888
Aplerbecker -----	9½	9½	18	24	20	7	3	0	0	1	4½	5½	5	5	4½	0	1½	3½	3½
Arenberg. -----	6	20	25	40	25	10	0	0	0	0	6	3	5	6	6	6	7	8	15
Kölnener Bgw. -----	5	10½	15	25	12	5	0	0	2	3	4	5	5½	7	5	5	4	4	6
König Wilhelm -----	--	--	--	--	--	0	0	0	0	0	0	0	0	0	0	0	0	--	--
Gelsenkirchen -----	--	--	--	17	10	7½	5½	6	6	7	7½	7	7	6	6	5½	5½	6	7
Harpener -----	15	25	60	40	15	0	0	2½	2½	3½	5½	2	3½	0	0	0	0	2½	6
Hibernia -----	--	--	--	13	4	2½	1½	2½	2½	3½	7½	4	5½	6	6	6	5½	4½	7½
Louise Tiefb. -----	--	--	--	10	0	0	0	0	2	2½	1	1	2½	2	0	--	--	--	--
Nordstern -----	--	--	--	0	0	0	0	0	0	0	0	--	1½	1½	0	1½	1½	1½	1½
	8.9	16.2	29.5	21.1	10.8	3.6	1.1	1.2	1.7	1.2	4	3.5	3.9	3.7	3.6	3.0	3.1	4.3	6.7

<sup>1</sup> Effertz, 1891, pp. 12-13.

The average here for the whole period is 4.7 per cent. Taking the period in common, *i.e.*, 1873-1888 inclusive the averages are 4.8 and 4.2 per cent. respectively.

The average of the mines here given shows a much higher percentage of profit than was obtained by our calculation from proceeds per ton. These mines, however, are undoubtedly better than the average.

DIVIDENDS.<sup>1</sup>

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902
Aplerbecker	12	25	13½	7	3	0	5	2½	4	5½	2	6	6	4
Arenberg	30	80	80	40	30	35	40	50	60	65	75	50	45	35
Bergb. u. Schiff.									6			9		6
Bochumer Bgw.	7	0	0	0	0	0	0	0	0	0	0	0	0	0
Kölnr Bgw.	0	20	20	10	5	6	9	12	16	19	21	30	35	35
Concordia	14	10	10	5½	4	5½	7½	13	19	19	21	29	25	18
Consolidation	5½	21	20	12	8	8	12	15	18	22	25	30	27	27
Dahlbusch <sup>2</sup>	9½	22	22	13½	8	9½	10	11½	12	11½	11½	13½	13½	---
Dannenbaum <sup>3</sup>	10	10	8	4½	3	2½	3	4½	4½	4				---
Königsborn								6½	8	8	10	12	8	7
König Wilhelm, St.	11	25	22	5	3	5	5	12	15	15	20	15	15	12
" " Pr.	16	30	27	10	8	10	10	17	20	20	25	20	20	17
Gelsenkirchen	7	12	12	9	6	6	7	7½	9	10	10	13	12	10
Harpener	15	20	10	5	3	5	6	8	9	10	11	12	10	---
Hilbernia	8½	19	12	5½	4	5½	7½	9½	12	12	12	15	13	10
Louise Tiefb., Kon. A.	9	10	3	0	0	0	0	0	0	0	1	2	0	---
" " St. A.	13	14	7	0	0	0	0	4	4	4	5	6	0	---
Magdeburg-	9	23½	33½	20	12	13½	25	28½	30	27	35	46½	42	35
Massen								2	4	4	6	9	11	7
Mark <sup>2</sup>	10	9	5	0	0	0	2	4	4	6	9	11	7	5
Mülheimer							5	6	6	0	0	5	5	---
Nordstern							4	10	10	14	16	20	20	16
Rhein Anthrac.	3	6	2½	0	0	4	7	10	10	14	16	20	20	16
Pluto, St. A.	10	10	7	3½	2½	0	5	7½	5	5	10	10	9	---
" " Pr. A.	3	25	15	11½	5	5½	8½	11	20	20	---	---	---	---
" " Pr. A.	5	25	15	11½	5	5½	8½	11	20	20	---	---	---	---
Neu Essen <sup>2</sup>	26½	60	66½	33½	30	30	28	30	30	35	35	35	---	---
	10.9	21.3	18.0	8.9	6.1	6.6	9.2	11.7	13.7	14.5	16.1	17.4	14.9	15.1

<sup>1</sup> Saling, 1903-4. <sup>2</sup> Enquete, p. 92. <sup>3</sup> Dortmund Jahrb., 1901.



Unfortunately, complete statistics in this form are not obtainable, because for a large part the "Gewerkschaft" organization takes the place of the "Actiengesellschaft," and a distribution of profits is made at a specific sum per "Kux" instead of a percentage on shares. We give below a table (pp. 259-60), compiled from the *Dortmunder Jahrbuch* (1901), of the divided profits (*Ausbeute*) and the assessments (*Zubusse*) levied per Kux for number of mines between 1885 and 1900.

An examination of the algebraic totals shows the course of profit, and this has substantially the same curve as that found for the corporations given in the following table. The most marked discrepancy is in 1899, which is due to an extraordinary "Zubusse" for one mine (*Friedlicher Nachbar*).

Neither dividends nor "Ausbeute," of course, tell the whole story. In prosperous times, good management requires the laying by of reserves and the improvement of the plant. Something of the situation, is revealed by the course of quotation of shares.<sup>1</sup>

<sup>1</sup> Compiled from Saling, 1903-4.

An inspection of the table (p. 261) shows quotations at a relatively high mark in 1889, a mark which was not equalled until 1897, and which was surpassed in only one other year (1899). Shares show a general decline since 1899—a little greater than dividends (17% against 12%), as might be expected with the tendency to discount a relatively unpromising future. The fact that shares advanced from the low point (1892) to the high point (1899) by 111%, while dividends between similar points advanced 160%, seems to show that there was no general attempt to conceal earnings by not dividing profits.

DIVIDED PROFITS AND ASSESSMENTS OF GEWERKSCHAFTEN.

	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902*
Altendorf . . . . .	..	..	..	..	260	320	320	0	0	0	-200	-250	-300	-400	-600	-600	..	-500
Baaker Mulde . . . . .	..	..	..	..	..	60	0	0	0	-300	-50	-300	30	20	20	..	..	..
Rosenblumendelle . . . . .	..	..	..	..	-75	-175	0	-100	-150	-25	-50	-300	-300	-1200	-775	..	..	..
Bickfeld . . . . .	..	..	..	..	..	0	120	120	0	0	0	-200	-150	-300	-300	..	..	..
Blankenburg . . . . .	..	..	..	..	75	140	100	100	100	110	100	100	60	50	170	300	..	100
Bommerhauker . . . . .	..	..	..	..	0	80	240	210	150	120	30	0	-200	-100	-300	60	..	-100
Borussia . . . . .	..	..	..	..	..	..	..	-300	-200	-300	-300	0	0	0	-300	0	..	120
Caroline . . . . .	..	..	..	..	0	0	0	0	0	0	0	0	-200	0	0	0	..	80
Carolus Magnus . . . . .	..	..	..	..	70	140	0	0	0	30	230	325	370	400	450	620	..	465
Charlotte . . . . .	..	10	0	0	55	180	165	0	0	0	0	50	0	0	0	0	..	..
Constantine d. Gr. . . . .	..	..	..	..	360	1000	740	330	190	260	-1185	270	436	600	600	1000	..	900
Dahlhauser . . . . .	50	100	65	0	50	200	215	0	0	-50	-150	-100	0	0	0	50	..	200
Dorstfeld . . . . .	..	..	..	..	200	570	550	0	0	0	0	-800	340	120	120	120	..	120
Eiberg . . . . .	..	..	..	..	105	285	200	0	110	160	200	220	270	300	300	300	..	200
Eintracht . . . . .	..	..	..	..	190	930	1100	240	0	0	0	0	0	0	200	380	..	350
Ewald . . . . .	..	..	..	120	150	700	820	760	720	20	720	765	900	900	1200	1200	..	1200
Freie Vogel u. Un. . . . .	..	..	..	..	115	170	150	20	40	50	45	50	0	0	-200	-100	..	..
Friedl. Nachb. . . . .	..	..	..	..	0	0	0	-60	0	-65	-250	0	-50	0	-3600	0	..	..
Friedr. d. Gr. . . . .	..	..	..	..	290	810	700	510	80	0	240	440	0	0	0	0	..	400
Fohl, Morgensonne . . . . .	..	..	..	..	500	1200	1400	600	450	400	325	450	525	450	525	700	..	525
Gen. Blumenthal . . . . .	..	..	..	..	..	245	30	-100	-600	-100	0	50	200	250	600	750	..	900
Graf Bismarck . . . . .	..	..	..	..	425	1050	1800	1400	1200	1200	1400	2000	2000	2000	2000	2000	..	2800
Graf Schwerin . . . . .	-400	-300	-250	-150	0	300	400	190	0	0	0	180	0	150	300	400	..	400
Heinrich . . . . .	60	50	0	0	140	360	450	160	150	130	160	190	80	60	160	350	..	325
Helene u. Amalia . . . . .	270	255	255	410	610	1370	320	350	450	550	550	800	1000	1000	1000	1700	..	1000
Hercules . . . . .	0	0	10	0	0	110	120	20	—	—	70	160	80	—	—	—	..	400
Joh. Deimelsburg . . . . .	..	..	..	..	-250	-150	0	0	0	100	150	130	260	300	60	350	..	325
Jul. Philipp . . . . .	..	..	..	95	270	220	0	0	-100	-250	-250	0	130	170	80	..	..	80
Kaiser Friedrich . . . . .	..	..	..	..	0	270	270	55	120	120	120	120	240	300	195	..	..	—

	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902*
Königin Elisabeth	..	..	..	250	500	1300	1200	570	450	450	450	500	600	700	950	1300	..	1000
König Ludwig	..	..	..	..	..	360	360	90	0	-810	80	200	400	400	400	400	..	400
Langenbrahm	150	180	180	210	390	800	800	600	550	300	350	575	800	800	600	600	..	600
Lothringen	..	..	..	120	120	720	810	230	30	240	0	400	400	400	600	900	..	1000
Mt. Ceniz	-300	-300	0	-500	0	150	200	-300	-400	-300	0	-500	-800	300	620	..	..	1095
Pörlingstiepen	0	0	15	60	120	240	300	165	120	120	120	120	120	120	120	120	..	325
Prinz Friedrich	..	..	..	..	25	25	20	10	20	0	0	0	0	0	0	0	..	..
Richardt	..	..	..	..	..	..	60	93	60	25	30	120	120	120	75	60	..	..
Rudolph	..	..	..	..	..	..	135	90	25	40	35	105	100	100	20	110	..	80
Schür. u. Charl.	30	10	..	..	32	185	185	25	0	15	30	90	120	60	75	100	..	120
Sieben Planeten	..	..	0	0	0	75	180	25	0	0	0	60	120	120	120	120	..	..
Steingatt	..	..	..	..	50	280	150	0	0	0	0	0	0	-300	-400	-450	..	-600
Stock u. Scheren.	..	..	..	..	30	240	160	0	0	0	0	0	0	80	80	40	..	..
Trappe	..	..	..	..	..	120	120	40	10	35	45	80	200	200	150	270	..	..
Trenonia	..	..	0	0	10	25	105	120	65	90	110	150	200	200	150	270	..	..
Unser Fritz	..	..	15	80	60	60	200	30	0	25	125	105	150	170	210	240	..	..
Victor	0	-300	100	100	200	850	1200	800	500	575	800	800	800	800	800	1000	..	1050
Victoria	0	0	0	0	50	400	1200	600	280	340	370	600	600	650	500	0	..	200
Victoria	..	..	0	0	0	0	-200	-100	-100	-200	-100	-300	-250	0	0	0	..	-150
Total	-140	-160	590	1025	5127	16413	27460	7538	4220	3705	4350	2750	9281	9990	6965	14520	..	14630
Average	-10	-11.4	34.7	51.3	125.0	364.8	596.9	160.4	91.7	80.5	92.6	58.5	197.5	217.2	151.4	372.3	..	430.3

\* Last column from *Essen Hk.*, 1902, Th. I. pp. 72-6. Rest from *Dortmunder Jahrb.*, 1901.

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902
Aplerbecker	220.25	210	149	126	112	102.25	139.75	122.25	133.60	132	116	108.25	90.25	90.50
Arenberg	520	532	510	397	427.50	539.80	625	774	810	916.75	1050	576	530	588
Bergb. u. Schiff.	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Bochumer Bgw.	149	103.50	44.22	36.25	70.75	83	96.75	81	83	75	33.80	---	---	---
Köln Bgw.	206	185	157	136	138.40	149.50	172.75	228.50	262.25	285.50	430	372	330	374
Concordia	---	130.60	89	70.50	86.25	115	135.90	238.75	297.50	271	321.75	271	286.75	283
Consolidation	223	191.50	153.50	140	163.10	173.80	204	248.75	290	306.80	402.90	339.75	302.50	353
Gelsenkirchen	219.50	176.50	133.25	127.10	145.50	167	171	170.90	192.10	191	198.25	180.75	170.40	179.90
Harpener	326.90	199.50	142.25	119.20	136.50	146.30	167.80	176.30	194.30	178.60	202.30	168.40	157.40	169.30
Hibernia	244.50	193.75	122	101.80	115.90	136.60	169	180.60	209.70	197.30	221.60	193.20	164.10	178.20
Königsborn	---	---	---	---	---	---	---	130	175	153	179	182	138.50	124.50
König Wilhelm, Pr. A.	16	30	27	10	8	10	10	17	20	20	25	20	20	17
" " St. A.	11	25	22	5	3	5	5	12	15	15	15	15	15	12
Louise Tief, Pr. A.	202.90	164	150.10	103	95	87	94	131.75	112.50	107.50	125	118.25	89.50	72
" " Kon. A.	165	127.50	77.99	59	57	---	55.10	98.60	78.25	72.25	82.50	74	49.25	37.50
Magdeburg, St. A.	303	255	248	234	---	250	340.50	410	461	---	474.50	490.50	460	482
Massen	---	97.10	62.75	43	37.25	63.25	68	139.75	134 <sup>1</sup>	136 <sup>1</sup>	168 <sup>1</sup>	147.75	111 <sup>1</sup>	107.80 <sup>1</sup>
Mülheimer	---	---	---	---	---	---	---	---	---	---	125	101	83	88.75
Nordstern	109	85	46.50	40.50	77.50	113.50	161.90	220.50	221	225	237.75	217	226.25	248
Rhein Anthrac.	---	114	79	77.25	70	69	74.50	138.50	132.50	118	128.80	114	116.10	126.10
Average	208.29	165.88	130.21	107.39	108.60	138.19	158.29	195.51	212.31	206.81	233.00	200.28	181.95	192.82

<sup>1</sup> Junge.

Only with a few mines do reserve funds appear to cut much of a figure; the principal question therefore is, how much has been written off for depreciation, and how far was this in excess of the necessary amount. Satisfactory material on this point covering the accounts of enough mines, over a series of years, to serve as a proof is, unfortunately, not at hand. Effertz in his analysis of the accounts of a large majority of the mines (*circa.*, 80%) for the period 1873-1890, finds an actual average for that period of 1.60%, which he declares to be excessively low, and due simply to the scanty earnings of the industry. He proposes as a modest amount 3%.<sup>1</sup> This would undoubtedly be regarded as rather low. The actual practice of the present day is to give a much more liberal allowance for depreciation. The following table shows what it is in the principal corporations of the Ruhr in 1902:<sup>2</sup>

<i>Company</i>	<i>Share Capital. m.</i>	<i>Depreciation. m.</i>	<i>Per Cent. of Share Capital.</i>
Aplerbecker . . .	2,400,000 . . .	239,809 . . .	9.1
Arenberg . . .	6,000,000 . . .	463,560 . . .	7.7
Bergb. u. Schiff. . .	7,000,000 . . .	376,380 . . .	5.2
Kölner Bgw. . .	6,000,000 . . .	706,542 . . .	10.1
Concordia . . .	8,000,000 . . .	494,058 . . .	6.2
Consolidation . .	16,000,000 . . .	1,278,670 . . .	7.9
König Wilhelm . .	5,700,000 . . .	523,970 . . .	9.2
Gelsenkirchen . .	60,000,000 . . .	5,968,528 . . .	9.9
Harpener . . .	60,000,000 . . .	7,586,536 . . .	12.6
Hibernia . . .	39,400,000 . . .	3,496,946 . . .	8.9
Königsborn . . .	9,000,000 . . .	750,000 . . .	8.3
Luise Tiefb. . .	7,722,600 . . .	289,921 . . .	3.7
Magdeburg . . .	2,100,000 . . .	372,171 . . .	13.0
Massen . . .	5,500,000 . . .	316,030 . . .	5.7
Mülheimer . . .	15,000,000 . . .	882,914 . . .	5.9
Nordstern . . .	20,000,000 . . .	1,786,281 . . .	8.9
Rhein. Anthrac. .	3,900,000 . . .	176,007 . . .	4.5
Average . . . . .			7.3

<sup>1</sup> Effertz, (1891), pp. 12-13.

<sup>2</sup> Compiled from Saling, 1903-4.

The amounts written off for depreciation here, though high in individual cases, do not seem excessively high on the average.<sup>1</sup>

The material respecting Upper Silesia is so scanty that it would be useless to attempt an analysis of the situation. It must suffice to give the proceeds per ton of the district, together with proceeds per ton of those mines belonging to the convention, and the fiscal mine Königin Luise.<sup>2</sup>

Year.	<i>Proceeds per ton</i>		
	<i>Upper Silesia.</i>	<i>Convention.</i>	<i>Königin Luise.</i>
1887.....	3.79	—	—
1888.....	3.78	—	—
1889.....	3.92	—	—
1890.....	5.04	4.78	—
1891.....	5.68	5.47	—
1892.....	5.70	5.54	—
1893.....	5.63	5.50	6.20
1894.....	5.48	5.38	6.15
1895.....	5.47	5.39	6.06
1896.....	5.47	5.35	6.23
1897.....	5.59	5.42	6.45
1898.....	5.88	5.70	6.76
1899.....	6.28	6.12	7.41
1900.....	7.48	7.39	8.30
1901.....	8.45	8.43	9.04
1902.....	8.03	7.98	—

The proceeds are much less than in the Ruhr, but the coal is of an inferior quality, and it has not so good a market. The costs are said to be 25% less than the Ruhr,<sup>3</sup> but no exact information apart from a few mines is available.

<sup>1</sup> They were probably somewhat higher in 1900 and 1901. Pieper says that a number of prominent mines wrote off 32,000,000 m. in 1901, which was equivalent to 9½% of their investment. Pieper, p. 106.

<sup>2</sup> Enquete, pp. 558, 279.

<sup>3</sup> Reichstag, 1902, p. 6119.

Profits in the Saar appear to have been much greater than in the Ruhr.<sup>1</sup>

(1) <i>Year.</i>	(2) <i>Cost of production per ton. m.</i>	(3) <i>Proceeds per ton. m.</i>	(4) <i>Net proceeds per ton. m.</i>	(5) <i>Estimated per cent profit. m.</i>
1893 -----	7.29 -----	8.94 -----	1.65 -----	10.1 -----
1894 -----	7.13 -----	8.81 -----	1.68 -----	10.3 -----
1895 -----	6.94 -----	8.90 -----	1.96 -----	12.0 -----
1896 -----	6.85 -----	8.94 -----	2.09 -----	12.8 -----
1897 -----	6.87 -----	9.28 -----	2.41 -----	14.8 -----
1898 -----	7.14 -----	9.53 -----	2.39 -----	14.0 -----
1899 -----	7.51 -----	10.35 -----	2.84 -----	17.4 -----
1900 -----	7.00 -----	11.99 -----	4.99 -----	30.6 -----

<sup>1</sup> Column (2) from Laur, II, p. 130; (3) from Enquete, p. 279; (4) calculated from (2) and (3); (5) calculated on capital investment of 16.32 m. per ton (same as Ruhr, see p. 254.)

In considering the reasonableness of coke prices, we have by no means such adequate criteria as for coal. The coke producers are almost all coal producers, and the lesser account is swallowed up in the larger, so that a comparison on the basis of earnings or dividends etc., is impossible. The only remaining test is a comparison of proceeds and costs. We have examined the problem of cost elsewhere, and it has been made clear that the uncertainty as to how much should be set down for the principal element, *i.e.*, coal, makes anything more than a rough approximation highly arbitrary. In making a comparison of the price policy of the Ruhr and the Saar (see p. 197) a table of average proceeds per ton for coke in the Ruhr has been given already. Those figures were obtained from the reports of the coke syndicate giving the total production and total estimated value of the production of the region. The quotient of these two figures gives the annual average proceeds for the syndicate.<sup>1</sup> As a check, however, on these figures the

<sup>1</sup>As may be seen by comparing the figures so obtained for 1900, 1901 and 1902 with those given in Enquete, p. 792.

following table has been compiled from data given in the *Dortmunder Jahrbuch*, 1901, for individual mines.<sup>1</sup> Considering that only 5 to 15 concerns are represented, while the syndicate includes 44, the results are fairly close.

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Dannenbaum	14.82	16.82	12.29	9.95	8.75	8.93	9.94	10.59	12.31	13.48	15.08
Concordia	---	---	---	---	---	8.45	9.16	9.76	10.90	12.93	13.52
Dorstfeld	12.47	16.73	12.53	10.26	8.32	8.28	8.77	9.52	10.79	12.53	13.08
Louise Tiefb.	---	---	---	---	8.43	8.46	9.29	10.06	11.83	12.96	14.70
Bruchstrasse	---	---	---	---	8.22	8.33	9.17	10.01	11.60	12.79	14.39
Bintracht Tiefb.	---	---	---	---	---	---	8.84	9.58	10.62	12.55	12.93
Friedr. Bruestine	---	---	---	10.28	10.40	10.37	10.52	9.97	11.39	13.23	13.25
Graf Beust	---	---	---	---	---	---	9.05	10.05	10.91	12.98	13.35
Graf Schwerin	---	---	---	---	---	---	---	9.55	10.59	12.51	12.94
Harpener	---	---	11.17	9.10	8.17	8.37	9.31	10.08	11.77	12.92	14.48
Helene u. Amalia	---	---	---	---	8.47	8.24	8.78	9.53	10.87	12.69	13.06
Julius Phillip	---	---	---	---	---	---	9.27	10.03	11.64	12.81	13.83
König Ludwig	12.16	16.86	12.18	10.20	8.51	8.49	8.92	9.73	10.73	12.75	13.06
Königsborn	11.40	20.74	12.70	10.31	8.58	8.33	8.88	9.71	10.80	12.65	13.09
Lothringen	10.18	18.37	12.97	10.25	8.45	8.22	8.29	9.61	10.63	12.66	13.06
	12.21	17.90	12.31	10.05	8.63	8.57	9.16	9.85	11.16	12.83	13.69

When we attempt to compare these syndicate proceeds with the cost of coke, we are met by the difficulty

<sup>1</sup> *Dortmunder Jahrbuch*, 1901.



already considered in the discussion on page 173, namely, what is the cost of coking-coal? If we should assume the average cost of coal as the basis, we should find that coke was sold at a loss of 1.47 m. in 1894, and below cost between 1892-1896 inclusive. The business, however, was not considered unprofitable at that time. In 1894, the Bochum Handelskammer describes the coke situation as tolerable,<sup>1</sup> and in 1896 as good.<sup>2</sup> The report of the coke syndicate for 1895 describes the market as satisfactory.<sup>3</sup> The relation of the average cost of coal and the proceeds for coke are shown in the following table:

Year.	Average cost of coal.	Correspond- ing cost of coke.	Average pro- ceeds Coke syndicate.	Differ- ences.
1889	5.47	8.94	—	—
1890	7.98	12.53	—	—
1891	8.38	13.10	13.11	+ .01
1892	7.38	11.67	10.86	— .81
1893	6.42	10.30	8.99	— 1.31
1894	6.38	10.24	8.77	— 1.47
1895	6.66	10.58	9.35	— 1.23
1896	6.77	10.80	10.10	— .70
1897	7.04	11.19	11.60	+ .41
1898	7.32	11.58	13.02	+ 1.44
1899	7.66	12.07	13.29	+ 1.22
1900	8.54	13.33	16.59	+ 3.26
1901	8.77	13.66	18.00	+ 4.34
1902	8.39	13.18	15.28	+ 2.10

Comparing these statements with the calculation of the cost of coke, on the assumed basis of average coal cost, it may be reckoned that in 1894, for example, the cost of coal should have been taken 17% lower, if cost and price were to balance, and in 1895, it should have been 13% lower. It is certainly not unreasonable to suppose that the actual cost of coke-coal may be taken generally as not greater than the average cost of coal. With a relatively weak demand it may be sold below

<sup>1</sup> *Bochum Hk.*, 1894, p. 5.

<sup>2</sup> *Id.*, 1896, p. 7.

<sup>3</sup> Report of coke syndicate, as given in *Bochum Hk.*, 1895, p. 9.

the average cost (or transformed to coke by the mine on an assumed value below average cost), while with a vigorous demand it may be advanced to a much greater sum according to what the market will bear. But, in estimating the reasonableness of coke prices, we may assume as a *maximum basis* of cost the average cost of coal. Applying this test to the years 1900 and 1901, we have evidence of the enormous profits of coke manufacture in those years—*viz.*, 3.26 and 4.34 m. per ton net proceeds. That profits were enormous may be readily seen by considering the small amount of capital required for a coke plant. The annual report of the mine "Consolidation," for 1902, put the value of its 150 ordinary ovens<sup>1</sup> at 30,926 m.,<sup>2</sup> and the 132 by-product ovens<sup>3</sup> at 767,769 m.<sup>4</sup> This would give a book value of about 206 m. per ordinary oven, and about 5816 m. per by-product oven. The book values are not, of course, entirely trustworthy, but they are approximate. The output of "Consolidation" was 242,473 tons.<sup>5</sup> With a coke price of 15 m., a cost of coke coal of 7 m., and labor in coking at 1.20 m. per ton, the net profit would be, it seems, over 600,000 m., or over 80% of the value of the plant, (without taking account of the revenue or plant of the by-product business). This is intended only as rough approximation. It may be tested by entirely independent data as follows. The cost of an Otto by-product oven (common in the Ruhr) is given as between 7,000 and 7,500 francs,<sup>6</sup> say 6,000 marks. The output

<sup>1</sup> Steinkohlenzechen, p. 62.

<sup>2</sup> Saling, 1903-4.

<sup>3</sup> Steinkohlenzechen, p. 62.

<sup>4</sup> Saling, 1903-4.

<sup>5</sup> Enquete, p. 791.

<sup>6</sup> *Bulletin Trimestriel de la Société de l'Industrie Minière*, 1903, p. 794. This is without the by-product accessories which require in addition about 11,000 to 12,000 francs.

of these ovens ranges, generally from 1,000 to 1,250 t.<sup>1</sup> Taking an average of 1,125 tons, a coke price of 15 m., a coking-coal price of 7 m., and a labor cost per ton of coke of 1.20 m., the net receipts would be about 110%. Here again the by-product plants are left out of account, which, though they greatly increase the revenue,<sup>2</sup> also add largely to the capital cost.

The gross returns of the ordinary ovens are much smaller than those of the by-product ovens, but the net return is unquestionably much larger, at least whenever the price of coke rises much above the cost of making it. Graf Kanitz cites an expert estimate for the capital element of cost as .80 per ton.<sup>3</sup> This was for an ordinary oven. Even assuming that the cost of coking coal should be taken as high as average cost, and taking the net proceeds on that basis as 3.26 m. and 4.34 m. for 1900 and 1901 respectively,<sup>4</sup> and the return on the capital investment as .80 m., the percentage of profit would be over 400 and 500 per cent. respectively, for the ordinary ovens. For the by-product ovens, the profits would be positively greater, though giving a smaller percentage return on capital. On these same assumptions coke production would give heavy losses for the period 1892-6, which does not seem to have been the point of view of the producers themselves at that time. If, therefore, we should assume that those years were profitable, and apply the same scale of cost to 1900 and 1901, the profits for those two years would be even greater. All such calculations, however, are more or less arbitrary, and the only solid fact seems to be that coke production furnished an inordinate profit in 1900-1.

<sup>1</sup> Enquete, p. 618.

<sup>2</sup> See p. 174.

<sup>3</sup> Kanitz, p. 11.

<sup>4</sup> See p. 266.

## CHAPTER VIII

### ORGANIZATION OF SALE AND THE COAL TRADE

From the general economic standpoint, the two chief functions of the cartells are the regulation of production and prices. Subsidiary to these, but connected intimately with them, is the regulation of the coal trade.

The coal *syndicate*, technically, is an organ established to control the sale of coal, not prices or production, for in these last two matters it is subordinate to the assembly of mine owners. The administration of the sale of coal, however, with a few trifling exceptions is in the hands of the syndicate.<sup>1</sup> The situation with respect to the coke cartell is substantially the same.<sup>2</sup> The convention in Silesia, on the other hand, maintains a quite different system; the sale of the commodity is left absolutely to the individual producers.<sup>3</sup> The regulation respecting the minimum price brings about a certain similarity of policy, however, and the individual members have put a large part of the sale into the hands of two coal dealers who are members of the Convention.

The most important question concerning the selling policy of the coal cartells is that of price discrimination to different classes of customers. This may be established directly, or indirectly, by compelling purchasers to buy of middlemen. In the Ruhr coal trade the lowest prices, namely, the regular syndicate prices are given to the large individual consumers whose annual orders are at least 6,000 t.<sup>4</sup> About 55% of the

<sup>1</sup> Cf., p. 82, *supra*.

<sup>2</sup> Cf., p. 86, *supra*.

<sup>3</sup> Cf., p. 106, *supra*.

<sup>4</sup> Enquete, p. 141.

total amount of coal is sold directly to the consumer,<sup>1</sup> and most of this is at regular syndicate prices. A similar discrimination exists in the coke syndicate ; direct sale at syndicate prices is made to purchasers of 100 to 150 tons or more per month, semi-annually.<sup>2</sup> From the point of view of the convention, this question cannot arise, because only the minimum price is fixed. This minimum price does not apply to the local smelting industry,<sup>3</sup> which may operate as a favorable discrimination. Preferential treatment may be granted by the individual sellers, and, as a matter of fact, it exists for large consumers.

The large purchasers of coal (6,000 t. or more per year), who buy directly of the Ruhr syndicate, including industrial consumers and wholesalers, get the syndicate prices, without preference. Certain consumers who purchase less than that amount, who were favored customers of the mines before the syndicate was formed, are given the same privilege, but the syndicate refrains from adding to the list.<sup>4</sup> The situation in the coke syndicate is the same, without the exceptions.<sup>5</sup> In Upper Silesia the wholesale trade is specially favored. The two great coal dealers of that district, Wollheim & Co., and Friedländer & Co., are themselves members of the convention. Friedländer, as the owner of the Emmagrube, is represented again as a regular mine-owner.<sup>6</sup> Both these dealers have large interests in coal properties, and, besides that, practically control the coal trade as consignees of about

<sup>1</sup> Denkschrift, p. 10.

<sup>2</sup> Enquete, pp. 687, 705.

<sup>3</sup> *Cf.*, p. 106, *supra*.

<sup>4</sup> Enquete, pp. 141-2 ; Denkschrift, p. 10.

<sup>5</sup> Enquete, p. 687.

<sup>6</sup> Enquete, p. 555 ; *Stat. Oberschl. B.-u. H.*, 1902, p. 24.

60% of the main line shipments.<sup>1</sup> Their price arrangements are not public, but probably they are as well treated by the convention as by the fiscus of Upper Silesia, which, for a minimum annual order of 50,000 t., gives them a 40 pf. rebate, on condition that they do not sell above the public mine price.<sup>2</sup> The general price system of the Silesian fiscus is regulated on the basis of the day price at the mine as follows,<sup>3</sup>

<i>Am't of purchase.</i>	<i>Rebate (M.)</i>
1,000- 3,000 tons.....	.10
3,000-25,000 " .....	.20
25,000-50,000 " .....	.30
Over 50,000 " .....	.40

The small consumers in the Ruhr are discriminated against by being excluded from direct purchase. In the case of the selling agencies of the coal and coke syndicates, the syndicates themselves make a price discrimination on quantity. Another form of price discrimination is in the preferential rates given to exclusive customers. They must agree neither to buy nor sell the coal of any non-syndicate mine *of the Ruhr district* under penalty of an additional price of 50 pf. per ton on their contracts.<sup>4</sup> The penalty does not apply to the purchase or sale, for example, of English coal.<sup>5</sup> A similar condition prevails in the coke syndicate, covering coal, coke and briquets, with a penalty of one mark.<sup>6</sup>

Control of the coal trade is also sought by other regulations in the contracts of sale. From the technical standpoint of production, coal mining is not a

<sup>1</sup> Enquete, p. 346.

<sup>2</sup> X Commission, p. 14.

<sup>3</sup> *Glückauf*, 1900, p. 786.

<sup>4</sup> Cf. contract forms, Enquete, pp. 299, 301, 302, etc.

<sup>5</sup> Enquete, pp. 160-1.

<sup>6</sup> *Id.* pp. 685-6.

seasonal industry, though the demand increases in the winter. Contracts, however, for commodities that are used continuously often tend to be made for fixed terms for the convenience of both producer and consumer. The question how long the term shall be is by no means a matter of indifference to either of them. For the coal producer, long term contracts for a large part of the output give a surer basis for economical operation, both technically and commercially, though he must save himself from liability in case of accidental interruptions. For the consumer, it has the advantage likewise of giving a greater security in supply and a better guarantee of uniformity in quality. Under stable conditions of industry, with respect to production and prices, a system of long-time contracts would have considerable advantages. The bad side of the system is seen in periods of rapid change, when contracts concluded at low prices result in large unearned gains to the purchasers, as compared with competitors who bought after the price had advanced, and, *vice versa*, contracts concluded at high prices involve undeserved losses when the *conjunctur* suddenly changes and prices fall.

At the present day in the Ruhr, the large majority of the contracts are made for a year. In the early seventies, monthly contracts were common with great price variations.<sup>1</sup> The historical practice, on the whole, however, has been contracts for a year, with exceptions in hard times (*e. g.*, 1893).<sup>2</sup> Yearly contracts prevail generally also in Upper Silesia, though each member of the convention is free to do as he pleases, and sometimes shorter terms are found.<sup>3</sup> In the coke syndicate, on the other hand, the practice of semi-annual con-

<sup>1</sup> Enquete, p. 108.

<sup>2</sup> *Id.*, pp. 105, 114.

<sup>3</sup> *Id.*, pp. 119, 341-3, 352.

tracts has been common, although the usual period is a year.<sup>1</sup> The so-called "fusion two year contracts" made in 1899 for 1900-1 were an extraordinary and undesirable exception.<sup>2</sup>

Considerable complaint has been made against annual contracts as unduly long.<sup>3</sup> These complaints became conspicuous since the beginning of the present depression, when the payment of high coal prices, agreed to before the crisis, was found very burdensome. Nothing was said, of course, about the previous *hausse* period when consumers had made gains by the same system. The cartell leaders, however, defend the annual contract system.<sup>4</sup> Little justification could be offered for two-year fusion contracts of the coke syndicate, but it found at least one defender among the consumers.<sup>5</sup> The chairman of the coal syndicate tried to extenuate the injury which had been caused, by arguing that without the two-year treaty the prices would have gone up much higher.<sup>6</sup> The trouble with his defense is that it is not so much a question whether prices would not have gone higher in 1900, as whether they would not have fallen lower in 1901. The means, also, by which these contracts were imposed upon iron producers, by a more or less covert threat that they would not otherwise obtain the needful supply, would be still harder to justify.<sup>7</sup>

In the contracts of the sale of coal, a clause is generally inserted, providing for the deposit of cash or collateral security for the payment of the same.<sup>8</sup> This has

<sup>1</sup> *Id.*, pp. 687, 689, 705.

<sup>2</sup> *Cf. supra*, p. 64.

<sup>3</sup> Enquete, pp. 111, 115, 163, 459, etc.

<sup>4</sup> *Id.*, p. 114.

<sup>5</sup> Kirdorf-Rote Erde, Enquete, p. 647.

<sup>6</sup> Kirdorf-Gelsenkirchen, Enquete, pp. 664-5.

<sup>7</sup> Enquete, pp. 647, 661; *Cent. Verband D. I.*, 1901, p. 238.

<sup>8</sup> *Cf.* contract forms, Enquete, Anlage, VI, pp. 285, *et seq.*



been customary since the beginning of the syndicate, though the requirement does not seem to have been enforced, except from coal dealers, or parties whose credit with the syndicate was not good.<sup>1</sup> The same requirement has been made by the coke syndicate.<sup>2</sup> Some complaint has been made of these requirements and in respect to discrimination in their enforcement, but the matter does not seem to have constituted a real abuse.<sup>3</sup> Another clause in the coal contracts that merits attention is that placing limitations on the free disposition of the coal by the purchaser. A penalty clause is inserted for all sales to parties reserved for the direct trade of the syndicate, or its selling agencies. The contract provisions of this sort for the industrial purchaser contain the provision that re-sale to railways, gas works, brick works or limekilns, or any reshipment from the original point of destination, shall be penalized by an addition of 3 m. per ton to the selling price.<sup>4</sup>

The contracts also contain provisions releasing the seller, wholly or partially, from the fulfilment of the same. A clause is generally inserted concerning the interruption of shipments on account of lack of water, and their subsequent dispatch. Another clause contains the provision that, if the purchaser does not take the coal contracted for according to the quantities and at the dates stipulated (excepting cases of interruption of transportation, not due to the fault of the purchaser), the syndicate shall have the right to reduce subsequent shipments. Another common clause has been subject to much criticism. An example reads as follows: "Essential interruptions of production, strikes, whether the same are

<sup>1</sup> *Enquete*, pp. 158, 222.

<sup>2</sup> *Id.*, pp. 695, 698.

<sup>3</sup> *Cf. Enquete*, pp. 695, 698.

<sup>4</sup> *Cf. contract form, Enquete*, p. 300.

caused by breach of contract or by notice of laborers, superior power (*höhere Gewalt*) of every kind, including mobilization and war, justify us for the duration and extent of the disturbance in the production and shipment to reduce the supply *pro rata* for the omissions caused thereby. These omissions will be supplied later."<sup>1</sup> The provision in the contracts of the coke syndicate, that quantities not delivered on time on account of interruptions of operation must be taken later, is characterized by Herr Kirdorf, as a "very gross mistake."<sup>2</sup>

Without going into further detail, it may be stated that these various provisions of the contracts have called forth lively criticism from the coal and coke purchasers as one-sided and unfair.<sup>3</sup> On the other hand, some coke consumers have admitted that they have been treated generously in the matter of postponing deliveries until the coke was needed.<sup>4</sup> One of the iron producers claimed that it was not possible in making a contract for a whole year to figure the need precisely, and therefore the coke syndicate should allow a little latitude in the fulfilment of the purchase.

Of peculiar interest is the above stated clause of the contract which excuses the coal producers from fulfilling their obligation in the case of interruptions through strikes. This exists both in the Ruhr and in Silesia.<sup>5</sup> It has been insinuated that advantage has been taken of this clause to provoke strikes, where it was desired to be relieved from the duty of furnishing the agreed supply.<sup>6</sup> It first appeared in private contracts in 1889.<sup>7</sup>

<sup>1</sup> Enquete, p. 301.

<sup>2</sup> *Cent. Verband D. I.*, 1901, pp. 36, 39.

<sup>3</sup> *Cf. Enquete*, pp. 221-2, 693-4, 702, etc.

<sup>4</sup> *Id.*, pp. 661, 682.

<sup>5</sup> *Id.*, p. 535.

<sup>6</sup> *Id.*, pp. 250, 534-5.

<sup>7</sup> *Id.*, p. 252.

In concluding this topic, it may be observed that the contracts of the fiscal works are even stricter.<sup>1</sup>

The organization of the sale of coal, coke, etc., is not limited to the central selling agency of the coal syndicate; in its wider development, it enters into the field of the dealers. In the central bureau there are four departments, each covering a certain territory. Besides these, there is a special selling agency at Düsseldorf, which is given orders for that city and neighborhood which do not exceed 6,000 t. per annum.<sup>2</sup> It is stated that the gross profit allowed to this branch is as follows:<sup>3</sup>

For lots up to	59 cars (10 tons)	8 marks per ton.
" "	119 " "	7 " "
" "	236 " "	6 " "
" "	359 " "	5 " "
" "	479 " "	4 " "
" "	600 " "	4 " "

This is said to be greater than was allowed to the dealers before its establishment.<sup>4</sup> The local dealers find themselves seriously injured by this invasion of their territory. Still another step has been taken by the syndicate, which may be considered as the beginning of an organization intended ultimately to control a large part of the coal trade. The wholesale dealers in certain districts have been amalgamated, under pressure from the syndicate, and, to the companies so formed, the syndicate refers all orders for coal which do not exceed 6,000 t. per annum. In a recent trade annual, six of these companies are given, located in Dortmund, Bremen, Cassel, Hannover, Magdeburg and Utrecht (Holland),<sup>5</sup> which have the sale of coal and

<sup>1</sup> Enquete, pp., 227-8.

<sup>2</sup> *Id.*, p. 29; *Dortmunder Jahrb.*, 1901, p. 543.

<sup>3</sup> *Id.*, p. 514.

<sup>4</sup> *Id.*, p. 512.

<sup>5</sup> *Steinkohlenzechen*, pp. 96-8.

coke. The exact field of each company is strictly defined. The reason for the formation of these companies was to promote the sale of syndicate coal, especially in the competitive or "disputed" regions, through a strong organization. They are given a monopoly of syndicate coal for six months, and, provided they are reasonable, they can charge what prices they please.<sup>1</sup> The syndicate has a constant and complete check on all their actions, through the councils (Aufsichtsräte) of the companies, in which one of the Vorstand of the syndicate is always a member. If they abuse their privilege, their monopoly, Herr Kirdorf says, would be withdrawn.<sup>2</sup> It is against the policy of the syndicate to admit new members to these organizations, as long as the present ones suffice.<sup>3</sup> It is also claimed that this system is necessary in order to control the dealers of the second rank—small wholesalers.<sup>4</sup> This establishment of a dealer's *rayon* has been denounced by the opponents of the cartells, but it has been defended, on the other hand, as commercially advantageous.<sup>5</sup> We have already noted elsewhere the organization by the syndicate of a cartell of dealers (Kohlenhandel Kontor) for the control of the Rhine shipping trade.<sup>6</sup>

Such organizations of trade would be technically impossible in Upper Silesia, under the convention, but the *de facto* position of Wollheim and Friedländer, in some respects, has a strong resemblance thereto. These two

<sup>1</sup> Enquete, p. 241.

<sup>2</sup> *Cent. Verband D. I.*, 1901, p. 243.

<sup>3</sup> Enquete, p. 241.

<sup>4</sup> *Id.*, p. 77.

<sup>5</sup> *Cf.* Reichstag, 1900, pp. 275, 282; Sarter, p. 39.

<sup>6</sup> *Cf.*, p. 103, *supra*.

dealers are said to have long term contracts for the sale of a considerable portion of the coal of the district.<sup>1</sup>

Loud complaints are made by the Handelskammer in Saarbrücken over a somewhat analogous arrangement of the fiscus of the Saar with two favored local merchants, who are given an absolute monopoly of the export business. This is a matter of special envy, because the commission allowed is much larger than for the domestic business (5 instead of 3 marks). The fiscus forbids purchasers to sell to iron works without permission, and dealers who buy of the fiscus are not permitted (practically) to buy any coal elsewhere.<sup>2</sup>

In regard to the relations of the producers to the middlemen, some reformers have favored a commission system throughout the country, in order to prevent dealers from exploiting the consumers. The coal producers, however, seem to think generally that this is not practicable.<sup>3</sup>

Whether the intervention of the syndicate in the coal trade is to be commended or condemned depends a good deal of course, on the conduct of the dealers. The trader or middleman is a favorite object of attack at all times and in all places, and too frequently the useful character of his operations is ignored. The policy of the syndicate in extending its control in this direction was favored by the bad methods of the dealers, and the hostility they excited by running up prices during the coal famine of 1900. That the prices exacted were extortionate was apparent, though just what is a fair price at retail is not so clear. Some data on this point, however, make a more intelligent comparison possible. In testimony before the Coal Commission in 1901, the large

<sup>1</sup>Sayous, p. 104.

<sup>2</sup>*Frankfurter Ztg.*, Oct. 26, 1903.

<sup>3</sup>*Denkschrift*, pp. 17-18; *Industrie Ztg.*, 1900, pp. 227-8.

Silesian dealers, Wollheim & Co., gave the difference between the wholesale and retail charges in Berlin, at a reasonable profit of 5 to 10%, as about 8 m. per ton.<sup>1</sup> Reckoned from the local wholesale price, this gives an advance of 35%. A Hamburg merchant declared in the Enquete that with a normal *en gros* price for screened nut coal of 1.95 m. per hectolitre, the value delivered at the house was at that time 2.70 m. This gives an advance of 42%; this same merchant says that an advance of 50% gives about 10% profit.<sup>2</sup> In the summer of 1903 the prices of Nusskohle in Berlin stood as follows,<sup>3</sup>

	<i>Per ton.</i>
Local wholesale.....	21.50-22.00 M.
Retail (per dz., 2.60).....	26.00 "
Petty retail (per 50 kg., 1.36) .....	27.20 "

The retail prices here show an advance of 18 and 24% respectively, but it is only just to state that at that time competition was severe and the market unfavorable, and the dealers claimed there was no profit.<sup>4</sup> Probably an advance of 6 m. gives a fair profit in general.

Complaint of the prices of coal dealers does not appear to have been very extensive before the recent coal famine, but at that time they abandoned all restraints of moderation, and exploited the situation for all it was

<sup>1</sup> X Commission, p. 4. In more detail the figures are :

Cost of coal at the mine.....	12.00 to 12.20 m.
Railway freight to Berlin .....	10.60 to 11.00 "
Transfer to warehouse .....	1.50 "
Cost of storage.....	.60 "
Screening .....	1.40 "
Loading and carting.....	2.30 "
Waste .....	1.00 "
General expenses and taxes.....	1.40 "
Retail price.....	31.40 "

<sup>2</sup> Enquete, p. 455.

<sup>3</sup> *Zeitschrift f. Braunkohlen*, 1903, p. 230.

<sup>4</sup> Enquete, p. 508.

worth. An investigation, instituted by the chambers of commerce of Westphalia, showed it to be almost universal in that region;<sup>1</sup> the Coal Commission of 1901 bears witness to the same fact for Prussia in general;<sup>2</sup> the same testimony comes from Silesia, Hessen, Holstein, Bavaria, Saxony, etc.<sup>3</sup> The syndicate dealers were also inculpated in some instances.<sup>4</sup> It was quite common, in these cases, to find the prices doubled. The same, or even worse, was true for coke.<sup>5</sup> The syndicate made efforts to prevent extortion, and severed relations with two dealers in consequence;<sup>6</sup> it also discharged some officials of the syndicate, who had been in collusion with the dealers in these practices.<sup>7</sup>

These excesses on the part of the dealers, gave the coal syndicate a ground or excuse to extend its influence and control still further into the sphere of the coal trade. The principal result was the incorporation of a new clause in the contracts of sale to dealers which reads as follows: "You bind yourself in the further sale of this quantity to so measure the selling price that the height of the profit shall not stand in an improper relation to your activity and risk under the circumstances. If you, or those who purchase from you, act contrary thereto, then you must pay to us for every ton sold at an excessive price a fine of ten marks. Furthermore, we are justified without further ado in withdrawing from all contracts of sale and supply existing between us. As to whether a case of excessive profit occurs, the cham-

<sup>1</sup> Cf. *Industrie Ztg.*, 1900, p. 525.

<sup>2</sup> X Commission, p. 18.

<sup>3</sup> *Oppeln Hk.*, 1900, p. 17; *Mittelfranken Hk.*, 1900, pp. 137-8; Enquete, pp. 210, 433; Calwer, 1900, p. 89, etc.

<sup>4</sup> Cf. Enquete, p. 370, Mecklenburg.

<sup>5</sup> Cf. Berlin prices, *Aeltesten*, 1900, p. 13.

<sup>6</sup> Sayous, p. 160.

<sup>7</sup> Reichstag, 1900, p. 295; *Cent. Verband D. I.*, 1901, p. 277.

ber of commerce of Essen, or a committee chosen by it for this purpose, shall decide to the exclusion of regular judicial determination."<sup>1</sup> This clause was first introduced in 1901. Graf Kanitz ridiculed the chamber of commerce of Essen as an arbitration court in such a matter,<sup>2</sup> which indignantly protested against the aspersions cast on its impartiality.<sup>3</sup> It has had no opportunity to act, though the syndicate has terminated relations with some dealers.<sup>4</sup> A similar control is exercised by the coke syndicate. Although complaints of the extortion of dealers were rife in 1898, the coke syndicate did not take action for about a year, when two means of preventing excesses were adopted. The first was increasing temporarily the opportunities for direct purchase in smaller quantities than regularly permitted.<sup>5</sup> The second measure was the introduction of a clause in the contracts of sale to dealers, whereby the latter agreed to limit their advances to 50 pf. per ton for lots over 500 t., and to 1 m. per ton for lots under 500 t. per year.<sup>6</sup> These regulations in the contracts respecting prices, both for coal and coke, place a restraint on *high* prices only. The dealers declare that it is even more in the interest of business that a minimum price limit should be fixed. They have pointed out that the fiscus in the Saar makes such agreements, and that the brown coal cartell of Cologne has established a minimum price for dealers.<sup>7</sup> In Silesia no attempt has been made in the direction of control of the coal trade for obvious reasons.

<sup>1</sup> Cf. contracts in *Enquete*, pp. 290, 295-6, 298, etc.

<sup>2</sup> *Reichstag*, 1900, p. 296.

<sup>3</sup> *Essen Hk.*, 1900, p. 9.

<sup>4</sup> *Enquete*, pp. 149-151.

<sup>5</sup> *Id.*, p. 688.

<sup>6</sup> *Id.*, pp. 689-90.

<sup>7</sup> *Id.*, pp. 222, 224.



The dealers are pretty generally against price restrictions in the contracts from motives of personal pride, as well as on economic grounds, but at least one defends it.<sup>1</sup> Herr Kirdorf himself thinks it will prove impracticable in execution.<sup>2</sup> The remarkable change which this and the other measures described above have wrought in the position of the dealer is stated by a Düsseldorf wholesaler as follows :

"If I say that we are not really merchants any more, I prove it as follows. The coal syndicate prescribes to us, first, what sorts we buy, second at what prices we buy them, third, the district of sale whence we may sell, fourth, the selling price at which we may sell. There naturally remains little of the freedom of trade. But I believe that the coal syndicate, according to the circumstances, cannot do otherwise. I do not complain of it, I only say in the future we large merchants must come to a clear understanding that it cannot be otherwise, and that we must become gradually less important. This fact is true to such an extent to-day that it is impossible to begin a wholesale trade on a large scale at all, because the quantities of coal for the same are not available. Moreover the present business is limited to such a degree that it is absolutely impossible to develop oneself."<sup>3</sup>

As another wholesaler expressed it, the dealers have become agents of the syndicate.<sup>4</sup> Herr Kirdorf explains the necessity of the situation as follows : The coal trade was overdeveloped, and the syndicate has been compelled to cut it down, but not without regard to the "existences" concerned.<sup>5</sup>

<sup>1</sup> Cf. Enquete, pp. 200, 218-220, 224, 229-233.

<sup>2</sup> *Cent. Verband D. I.*, 1901, p. 243.

<sup>3</sup> Enquete, pp. 230-1.

<sup>4</sup> *Id.*, p. 235.

<sup>5</sup> *Id.*, p. 235.

*Consumers' Associations.*—Even more significant in some respects, than the relations of the cartells to the dealers, are their relations to the consumers' associations. This interest and significance lies more in their latent possibilities and future than in their present importance. The consumers' association may be regarded as the anti-cartell, or rather it is the consumers' cartel. The history and meaning of these societies in Germany has been made the subject of an interesting monograph by Dr. Riehn. He gives a statistical view of their growth in the following table : <sup>1</sup>

	1864.	1900.
Number of associations.....	38	568
Members.....	7,700	522,000
Turn-over.....	800,000 m.	126,900,000 m.
Assets .....	79,000 m.	15,700,000 m.

Dr. Riehn believes them to be a necessary development of our modern economic system, wherein the trader and consumer are in danger of undue exploitation from the cartelled producers.<sup>2</sup>

"There remains open, therefore, to the consumer only the way of self-help, if he would protect his interests against the producer. From him must be exerted a counter pressure against all those members in the system of the production and distribution of goods which have passed along the pressure from the producer to him. \* \* \* \* Against the previous system of anarchy in production the cartel signifies just what the consumers' associations signify for consumption."<sup>3</sup> It is from this point of view that the question of the relations of the consumers' associations to the coal cartel should be considered.

Consumers' associations are formed for the purchase

<sup>1</sup> Riehn : *Das Konsumvereinswesen in Deutschland*, p. 19.

<sup>2</sup> *Ib.*, pp. 44-57.

<sup>3</sup> *Ib.*, pp. 59, 60.

of particular articles and for consumption in general. There are a good many important coal buying associations,<sup>1</sup> but in most general buying associations, coal is one of the important articles of purchase. Some of these associations are agricultural, some are industrial, while others include all kinds of persons, officials, peasants, laborers, etc.<sup>2</sup> In the region along the Rhine, for example, especially in Hessen-Nassau and the Grand Duchy of Hessen, it is said that there are such associations in every town, large and small, and these are united together in a general association.<sup>3</sup> Some of them are financially strong, others are not. The conditions of demand naturally vary also, according to the character of the membership—industrial or agricultural, etc.

These associations endeavor, of course, as far as possible, to do away with the dealer by purchasing directly from the producers. In the case of coal, they desire to buy directly from the syndicate, the convention mines or the fiscal administration, as the case may be. The coal cartells have been to a certain extent a cause for the formation of these associations, as a sort of anti-cartell,<sup>4</sup> but these organizations would have been formed in any case. The association movement among consumers has a foundation independent of combinations among producers, viz., economy of wholesale purchase, although such combinations may accelerate their growth. Though the consumers' association are to a certain extent anti-cartell, this is to be understood rather in the sense of counter-weight than of enmity. In fact, they frequently justify the cartells, and say

<sup>1</sup> *Cf.*, Enquete, pp. 127, 135.

<sup>2</sup> *Id.*, pp. 135, 211.

<sup>3</sup> *Id.*, pp. 210.

<sup>4</sup> *Id.*, p. 127.

that they are themselves cartells, or that the syndicate is a "Genossenschaft".<sup>1</sup> They feel, however, that this fraternal sentiment is not shared by the coal cartells, and that, in fact, the refusal of the syndicates to treat with them is due to the desire to prevent the formation of a "Gegencartell".<sup>2</sup> The attitude of the syndicate has been openly hostile. In the recent Enquete, Herr Kirdorf declared that it was impracticable to deal with them directly. Herr Unckell openly advised them that they could not hope for it. The representatives of the associations made such a strong showing however, that Herr Kirdorf afterwards adopted a very conciliatory tone, and declared that the matter ought to receive particular consideration.<sup>3</sup> They have received favorable consideration from the government,<sup>4</sup> but the practical experience of the fiscus led the Prussian Minister of Trade and Industry to put their commercial responsibility in question.<sup>5</sup> The consumers' associations themselves, on the whole, find their dealings with the fiscus, whether in the Saar or in Upper Silesia, of a satisfactory character.<sup>6</sup> In 1900, it appears that the fiscus of Upper Silesia sold 95,000 t. to such associations, and the *état* for 1901 proposed an extension of such sales to 367,000 t.<sup>7</sup> The "suffering" agricultural industry in Germany has always received particular consideration from the administration.

The stiff attitude of the syndicate on the other hand

<sup>1</sup> Enquete, pp. 403, 406, 413.

<sup>2</sup> *Id.*, p. 137.

<sup>3</sup> *Id.*, pp. 236, 413, 744.

<sup>4</sup> Reichstag, 1900, p. 282 (Brefeld); X Commission, pp. 26-7; Abgeordneten, 1900, p. 935.

<sup>5</sup> Reichstag, 1900, p. 282 (Brefeld). Abgeordneten, 1900, p. 847 (Brefeld).

<sup>6</sup> Enquete, 407, 432.

<sup>7</sup> X Commission, 12.

has been softened by no particular sympathy for the agricultural interest, which, so far as the business side of the question is concerned, after all has a relatively small consumption. The real reasons for its attitude are commercial, which are justified as follows: (1) that the associations are not financially reliable, (2) that they engage in trade, (3) that their consumption is fluctuating, either (a) on account of the fluctuating character of their wants, or (b) because they cannot keep the custom of their members whenever coal is offered at a lower price elsewhere, (4) the impracticability of administration for such customers, (5) necessity of defending interests of dealers who cannot be entirely dispensed with.

To the objections made by the syndicate that the associations are not financially reliable, the latter protest, and in some cases offer to give any reasonable guarantee.<sup>1</sup> It seems here, as in most other points made against the associations, that there are strong and weak, good and bad. The syndicate has simply refused to give them a fair trial. The charge that they trade<sup>2</sup> seems to be justified in some cases, though in others it seems to be a consequence of confusing their sale to affiliated societies with general selling.<sup>3</sup> The "Hauptgenossenschaft zu Berlin" gave up the special privileges accorded to it by the fiscus in order to be able to sell to non-members.<sup>4</sup> Capable of more definite proof is the charge that they do not take their supplies in regular quantities. This is a matter of real importance to the coal companies on account of expense of storage, difficulties in sending out cars, etc. The coal producers and dealers furnish a

<sup>1</sup> Enquete, pp. 135, 215, 409, 428, 449.

<sup>2</sup> *Id.*, pp. 414, 422, 743.

<sup>3</sup> *Id.*, p. 437.

<sup>4</sup> Abgeordneten, 1900, pp. 934-5.

good deal of statistical illustration of this irregularity.<sup>1</sup> Herr Williger (head of the convention) gives an instance of the purchases of the Ostpreussische Feuerungsmaterial-Einkaufsgenossenschaft in Königsberg. They bought 9300 Zentner for Feb., 1903, and took only 5320 Zentner; of the same purchase for March they took (for first three weeks) only 2000 Zentner. The interesting feature is Herr Williger's explanation, viz., that English coal was suddenly offered at lower prices, and they simply transferred their custom. He says the same thing occurs in Silesia, but recommends indulgent treatment.<sup>2</sup> Another example is that of the Landwirtschaftlichen Ein- und Verkaufsgenossenschaft für Schlesien in Breslau.

	<i>Bought.</i> Z.	<i>Took.</i> Z.
December, 1902 -----	19,000 -----	12,520
January, 1903 -----	19,000 -----	12,500
February, 1903 -----	24,100 -----	13,200
March (to 23rd) -----	24,100 -----	6,100

In this case the especially small quantity taken in March seems to have been due to the approach of the summer price schedule of April 1.<sup>3</sup> Irregularity in taking orders is a weakness of agricultural consumers for whom the need for coal, as well as convenience of opportunity in hauling the same, varies a good deal from season to season.<sup>4</sup> The associations claim, on the other hand, that they can take their orders regularly, and some of those that have dealings with Upper Silesia give no ground for complaint in this respect.<sup>5</sup> Herr Kirdorf considers the technical administrative difficulties of handling the orders of these numer-

<sup>1</sup> Enquete, pp. 439-442, 232-3, 136, 403, 215.

<sup>2</sup> *Id.*, p. 441; *cf.*, p. 426.

<sup>3</sup> *Id.*, pp. 441, 442.

<sup>4</sup> *Id.*, pp. 403, 442.

<sup>5</sup> *Id.*, pp. 407, 449, 428.

ous customers with small orders for various sorts of coal would be so great as to cause a considerable increase in costs.<sup>1</sup> To this the associations answer that they will take the order as a whole, and look out for the distribution of it themselves.

Finally the syndicate objects to direct sale to the associations on account of its desire to protect the dealers, whom it regards as necessary instruments in the sale of coal.<sup>2</sup> The difficult parts of sale—storage and sale—sale to the small consumers, sale of surpluses, sale of less desirable brands, etc., are more conveniently accomplished through middlemen. When they purchase they are required to take along with the good many inferior sorts, a condition which is not so easily imposed on the loosely organized associations, although they do offer a considerable variety in demand.<sup>3</sup> For these reasons, chiefly, the syndicate has almost invariably refused to deal with the associations, and referred them to the dealers.<sup>4</sup> In one case, however, an association of manufacturers in Holstein forced their hand by transferring their trade to the dealers in English coal in Hamburg.<sup>5</sup> The associations have therefore been referred generally to the dealers. There is naturally no love lost between them and the dealers, and complaints are frequent of bad treatment<sup>6</sup> though this is not invariable,<sup>7</sup> especially where the dealers are engaged in a price war with each other. Recently a complaint appeared from the *Centralverband der Kohlenhändler Deutschlands*, that the purchasing

<sup>1</sup> Enquete, p. 236.

<sup>2</sup> *Id.*, pp. 216, 237; *Cent. Verb. D. I.*, 1901, p. 241.

<sup>3</sup> Enquete, p. 410.

<sup>4</sup> *Id.*, pp. 135, 416, 214, 225.

<sup>5</sup> *Id.*, p. 435.

<sup>6</sup> *Id.*, pp. 212, 407, 415.

<sup>7</sup> *Id.*, pp. 216, 226.

associations of government officials (Beamten-genossenschaften) were engaged in trade.<sup>1</sup> Where the associations have been able to get coal directly they find their business with their members embarrassed by price cutting, which is often sufficient to seduce the loyalty of the associates.<sup>2</sup> No suspicion seems to have been directed against the syndicate as furthering this disloyalty.

The cause of the unfriendly relations between the syndicate and the associations seems to lie partly in the existence of a slight opposition of interests between the parties, but chiefly in the lack of business-like organization and practice in the case of some of the associations, on the one hand, and the contemptuous impatience of the syndicate with their business and methods on the other. The recent tendency to adopt a more conciliatory policy towards these associations is probably due less to a change of conviction or change of heart on the part of the syndicate than a politic desire to hush the incessant demands of the associations for recognition.<sup>3</sup> Though they might be able to exert some pressure politically,<sup>4</sup> they are not yet enough developed to exert an important economic influence.<sup>5</sup>

<sup>1</sup> *Tageblatt*, June 15, 1903.

<sup>2</sup> Enquete, pp. 416, 436, 456, 562.

<sup>3</sup> Cf., J. B. Landwirtschaftskammer f. d. Rheinprovinz, 1900, p. 70 ; Abgeordneten, 1900, pp. 855-6, 3332 ; Reichstag, 1900, p. 297.

<sup>4</sup> Enquete. p. 431.

<sup>5</sup> Cf., Calwer, 1901, pp. 106-7.



## CHAPTER IX

### CONDITION OF LABOR UNDER THE CARTELL RÉGIME

Circumstances do not require that we should make any extensive examination of the labor conditions of the coal industry. The syndicate and the convention have no relations with labor,<sup>1</sup> nor have they attempted to control or interfere in that side of the business. These matters are left entirely to the individual mines; even the Verein in Dortmund has taken no hand in the matter of wages,<sup>2</sup> though some associations of mine owners have been formed to deal with the matter of strikes.<sup>3</sup> Undoubtedly the coal cartells have had some influence of an indirect sort on labor, but in the sense that any condition which affects the prosperity of an industry in the long run affects the wage earner. Chief among the lines of possible influence are wages, the regularity of employment, length of day, external conditions of employment, independence of contract, cost of living, etc. While claiming that the coal cartells have no direct influence on labor relations, the leaders of the same assert that their indirect effect has been beneficial, both as respects wages and regularity of employment.<sup>4</sup> Of course there have not lacked others who have claimed that its influence was injurious to labor.<sup>5</sup>

A statistical summary of the wages paid gives a fair idea of the situation in this important particular.

From the beginning of the syndicate until 1900, the maximum year, wages advanced 33.1% in the Ruhr. From 1890, the year of the beginning of the convention, until 1900 the rise in Upper Silesia was 31.6%. But

<sup>1</sup> Enquete, pp. 252, 245, 534, 755.

<sup>2</sup> *Id.*, pp. 255-6.

<sup>3</sup> See p. 46.

<sup>4</sup> Enquete, pp. 534, 253.

<sup>5</sup> *E. g.* von Rottenburg, *cf.* p. 296.

Year.	OBERSCHLESIEEN			NIEDERSCHLESIEEN			DORTMUND			SAAR		
	Lab'rs	Shift Wages	Yearly Wages	Lab'rs	Shift Wages	Yearly Wages	Lab'rs	Shift Wages	Yearly Wages	Lab'rs	Shift Wages	Yearly Wages
1888--	40870	m. 1.85	m. 516	13974	m. 2.04	m. 630	102195	m. 2.69	m. 863	24402	m. 2.92	m. 842
1889--	43183	2.03	575	14441	2.23	682	112073	3.05	941	25666	3.24	933
1890--	48321	2.37	671	15841	2.45	735	123984	3.49	1067	27528	3.79	1114
1891--	53493	2.46	693	16669	2.50	759	134603	3.54	1086	28897	3.89	1137
1892--	53995	2.43	669	17294	2.46	747	138231	3.28	976	29823	3.69	1042
1893--	52978	2.42	661	17205	2.42	729	142285	3.14	946	27536	3.37	925
1894--	52300	2.45	664	17282	2.40	723	148280	3.16 <sup>1</sup>	961	30070	3.24	921
1895--	52388	2.46	675	17834	2.43	737	150212	3.18	968	30531	3.27	929
1896--	54583	2.49	697	18404	2.49	757	157137	3.29	1035	32397	3.28	966
1897--	56376	2.58	721	18846	2.59	787	171040	3.57	1128	34248	3.34	982
1898--	58803	2.73	771	19522	2.67	812	185953	3.74	1175	35856	3.40	1015
1899--	61989	2.87	801	20459	2.80	846	199138	3.96 <sup>1</sup>	1255	38049	3.46	1019
1900--	68425	3.12	877	22146	3.00	910	220031	4.18	1332	40303	3.56	1044
1901--	77183	3.10	872	24107	2.92	871	236769	4.07	1224	41923	3.54	1042
1902--	79179	2.97	820	24061	2.73	799	236543	3.82	1131	42036	3.57	1053

<sup>1</sup> *Tieft. Berg.-Hütt. u. Salinen, 1903, I, p. 38.*

it would be fairer to take a year or two previous to the *hausse* of 1890; for example, if 1888 were substituted, the advance for Upper Silesia would be 69%. For the

same period the Ruhr shows 55%. Wages in recent years have been highest in the Ruhr. In this respect the Saar stands second. The advance in the Saar has been slight in the last fourteen years (22% between 1888 and 1902).

	(a) All Classes.		(b) Regular Miners.		(c) Other Under-ground laborers.		(d) Laborers above ground.		(e) Boys under 16 years.		(f) Female.	
	Number.	Aver. wages, year.	Number.	Aver. wages, year.	Number.	Aver. wages, year.	Number.	Aver. wages, year.	Number.	Aver. wages, year.	Number.	Aver. wages, year.
Upper Silesia -	77,183	872	44,152	969	11,618	919	15,144	783	2,120	302	4,149	321
Lower Silesia.	24,107	871	12,234	936	4,434	906	6,303	810	797	332	339	469
Dortmund ----	236,769	1224	119,130	1447	67,267	1024	42,290	1080	8,082	355	---	---
Bonn -----	41,923	1042	24,517	1191	10,322	855	5,610	929	1,474	316	---	---

<sup>1</sup> Berg. Hütten u. Salinen, 1902, pp. 3-3, St. Thell.



LOWER SILESIA.											
UPPER SILESIA.											
(a)			(b)			(c)			(a)		
Regular miners.			Other under-ground laborers.			Laborers above ground.			Regular miners.		
Shift.	Year		Shift.	Year		Shift.	Year		Shift.	Year	
1888	2.07	565	1.91	558	1.68	498			2.18	667	2.13
1889	2.31	638	2.06	614	1.83	539			2.40	728	2.35
1890	2.71	748	2.36	699	2.10	633			2.67	792	2.52
1891	2.83	774	2.44	728	2.17	649			2.74	824	2.57
1892	2.79	739	2.41	709	2.16	639			2.67	805	2.57
1893	2.74	727	2.42	704	2.15	622			2.60	775	2.54
1894	2.79	730	2.44	708	2.15	619			2.64	796	2.52
1895	2.78	740	2.46	713	2.14	634			2.59	773	2.49
1896	2.82	768	2.50	731	2.16	640			2.68	814	2.60
1897	2.91	794	2.61	765	2.22	648			2.80	849	2.70
1898	3.09	856	2.71	803	2.34	680			2.89	876	2.78
1899	3.27	896	2.86	827	2.44	705			3.04	916	2.92
1900	3.57	983	3.14	918	2.66	771			3.27	991	3.11
1901	3.52	969	3.17	919	2.69	783			3.15	936	3.03
1902	3.35	902	3.07	873	2.63	762			2.91	848	2.82

These statistics show, therefore, a great advance in wages during the period of the cartells. Whether this should be attributed to them depends on the answer to the question whether the *hausse* was caused or strengthened by the cartells, or whether it was simply the prosperity of German industry and the great demand for labor that caused this advance in wages. Although a slight decline in wages has set in since the crisis, it seems probable that the laborer will keep most of this advance permanently, because the productive power of labor generally in Germany has increased.<sup>1</sup>

The productivity of labor has not increased in coal

<sup>1</sup> May, pp. 592-3.

mining, however, measured in actual output, as may be seen from the following table of output *per capita* per shift.<sup>1</sup>

	<i>Upper Silesia.</i>	<i>Lower Silesia.</i>	<i>Dort- mund.</i>	<i>Saar.</i>
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
1888 . . .	1.265 . . .	0.739 . . .	1.015 . . .	0.886
1889 . . .	1.292 . . .	0.735 . . .	0.981 . . .	0.822
1890 . . .	1.233 . . .	0.674 . . .	0.935 . . .	0.767
1891 . . .	1.178 . . .	0.669 . . .	0.906 . . .	0.756
1892 . . .	1.110 . . .	0.649 . . .	0.895 . . .	0.744
1893 . . .	1.183 . . .	0.693 . . .	0.900 . . .	0.780
1894 . . .	1.216 . . .	0.708 . . .	0.900 . . .	0.772
1895 . . .	1.255 . . .	0.718 . . .	0.898 . . .	0.792
1896 . . .	1.284 . . .	0.725 . . .	0.908 . . .	0.808
1897 . . .	1.310 . . .	0.723 . . .	0.897 . . .	0.819
1898 . . .	1.357 . . .	0.735 . . .	0.873 . . .	0.819
1899 . . .	1.356 . . .	0.725 . . .	0.865 . . .	0.805
1900 . . .	1.293 . . .	0.709 . . .	0.851 . . .	0.795
1901 . . .	1.165 . . .	0.654 . . .	0.821 . . .	0.759
1902 . . .	1.118 . . .	0.649 . . .	0.828 . . .	0.766

This diminution of productivity is due presumably to the increasing difficulty of mining.<sup>2</sup> It affords, therefore, no fair standard of what the laborer should be paid; on the other hand, an increase in price of coal is hardly in itself, as some seem to think, a sufficient ground for an advance in wages.<sup>3</sup> This is obviously true, for example, where the price advance is due to an increase of other costs, or to an undue exploitation of the consumer. In the eighties, prices fell much lower than wages.<sup>4</sup> The comparison of wages with profits is only valid (if ever) for the laboring class and industry in general.<sup>5</sup> As far as the position of the mining laborer

<sup>1</sup> *Berg. Hütt. u. Sal.*, 1903, p. 43.

<sup>2</sup> Enquete, p. 482.

<sup>3</sup> *Cf. e. g.*, Enquete, pp. 250-1; Schoenlank, pp. 527-8; Kulemann, *Juristentag*, pp. 325-6.

<sup>4</sup> Huckinghaus, p. 87.

<sup>5</sup> Liefmann, however, advocates advancing wages in proportion to increase in profits, Liefmann, *Unternehmervverbände*, p. 198; and Landesberger thinks the laborer has a claim to a part of the gains of the Cartell. Landesberger, *Juristentag*, p. 342.

compared with other laborers is concerned, it seems to be favorable to the former on the whole, both before and since 1890.<sup>1</sup>

Dr. von Rottenburg, in an attack on the cartells, cited as a proof of their unfavorable effects on labor that the wages in the fiscal mines of Upper Silesia were considerably higher than the average. The situation in 1902 may be summarized as follows :

AVERAGE ANNUAL WAGES PER CAPITA.

	Men.	Women.	Boys.	Total.
Upper Silesia, (excluding Fiscus) .	948 m.	308 m.	301 m.	890 m.
Fiscus . . . . .	1072 "	429 "	333 "	1064 "

The figures for the non-fiscal mines include some not in the convention, but they are not important. The showing here is undoubtedly strongly in favor of the fiscus. The effect is not so impressive, however, if we observe that the fiscus possesses only two mines, and that these are exceptionally productive. The total per capita per shift wages are for the private mines 3.20 m. and for the fiscal mines 3.65 m.<sup>2</sup> Some of the private mines, such as the Paulus, approach very near the standard of the fiscus; for this mine the annual average wages were, for men, 1019 m.; for boys, 354 m.; and for women, 359 m.; the wages per capita per shift were 3.57 m.<sup>3</sup> The larger mines seem to make the best showing among the private mines, but none of them approaches the two fiscal mines in size. If we turn to the Ruhr, we shall find that equally great differences prevail between different mines; for example, the wages

<sup>1</sup> Cf. *Industrie Ztg.*, 1903, pp. 14-16, 63-64. Two articles by Dr. Tille on effect of cartells on wages. Huckinghaus, pp. 85, 119-20.

<sup>2</sup> Compiled from *Statistik Oberschl. B.-u. H.*, 1902, pp. 4-5.

<sup>3</sup> *Id.*, 1902, pp. 4-5.

per capita per shift for the period from 1893-1899 (inclusive) averaged as follows:<sup>1</sup>

o. b. a. b. Dortmund . . . . .	3.43 m.
<i>Syndicate mine</i> , Mt. Cenis . . . . .	3.94 "
<i>Syndicate mine</i> , Magdeburg . . . . .	3.86 "
<i>Non-Syndicate mine</i> , Preussische Claus . . . . .	2.49 "

This table does not prove anything for or against the syndicate. In fact the question of wages is determined by other considerations.<sup>2</sup> Again, it would not be proper to compare the scale of wages in two different districts, though on such a basis the Ruhr would, at least in recent years, make a much better showing than the Saar, as may be readily seen by an examination of the tables given above.

One of the advantages claimed for cartells by its advocates is the more steady employment of labor,<sup>3</sup> and the diminution of the "reserve army" of the unemployed,<sup>4</sup> though of course these claims are disputed.<sup>5</sup> In the case of the coal industry, fortunately the principal facts are obtainable, and are not a mere matter of opinion. The following tables give the number of laborers, the total number of shifts per year, and the average of the same per laborer.

A survey of this table shows, first, a very constant increase in the number of laborers employed, and, second, an equally striking regularity in the average annual number of days per laborer. In the Dortmund district the variations in the latter figure are slightly greater before than after the formation of the syndicate. The maximum variation during the period of the syndicates'

<sup>1</sup> *Dortmunder Jahrb.*, 1901.

<sup>2</sup> Enquete, (Kirdorf), p. 253.

<sup>3</sup> Grunzel, p. 137.

<sup>4</sup> Brentano, p. 26-7.

<sup>5</sup> *E. g.* Schoenlank, pp. 533-4; Vogelstein, p. 96.



YEAR.	UPPER SILESIA.			LOWER SILESIA.		
	Number of laborers.	Total Number of Shifts.	Annual average per laborer.	Number of laborers.	Total Number of Shifts.	Annual average per laborer.
1884	----	-----	----	----	-----	----
1885	----	-----	----	----	-----	----
1886	40,093	10,827,501	270	13,184	3,872,635	293
1887	39,973	10,799,964	270	13,572	3,964,855	292
1888	40,870	11,426,739	280	13,974	4,323,156	309
1889	43,183	12,195,516	282	14,441	4,419,761	306
1890	48,321	13,678,250	283	15,841	4,754,551	300
1891	53,493	15,042,703	281	16,669	5,061,419	304
1892	53,905	14,802,945	275	17,294	5,255,995	304
1893	52,978	14,458,544	273	17,205	5,186,417	301
1894	52,300	14,149,503	271	17,282	5,203,604	301
1895	52,388	14,400,963	275	17,834	5,400,779	303
1896	54,583	15,275,644	280	18,404	5,605,041	305
1897	56,376	15,740,882	279	18,846	5,732,625	304
1898	58,803	16,586,138	282	19,522	5,938,032	304
1899	61,989	17,303,483	279	20,459	6,191,010	303
1900	68,425	19,202,080	281	22,146	6,726,037	304
1901	77,183	21,683,277	281	24,107	7,199,326	299
1902	79,179	21,895,207	277	24,061	7,037,951	293

YEAR.	DORTMUND.			SAAR.		
	Number of laborers.	Total Number of Shifts.	Annual average per laborer.	Number of laborers.	Total Number of Shifts.	Annual average per laborer.
1884	----	-----	----	25,050	7,497,631	299
1885	----	-----	----	25,259	7,328,322	290
1886	99,952	29,944,901	300	24,714	7,009,483	284
1887	102,195	32,744,272	309	24,240	6,863,315	283
1888	102,195	32,744,272	321	24,402	7,044,511	289
1889	112,073	34,536,776	308	25,666	7,402,343	288
1890	123,984	37,943,370	306	27,528	8,099,128	294
1891	134,603	41,302,478	307	28,897	8,447,211	292
1892	138,231	41,167,434	298	29,823	8,416,568	282
1893	142,285	42,891,969	301	27,536	7,544,148	274
1894	148,280	45,101,880	304	30,070	8,537,175	284
1895	150,212	45,818,644	305	30,531	8,691,261	285
1896	157,137	49,437,574	315	32,396	9,538,614	294
1897	171,040	54,000,336	316	34,248	10,085,126	294
1898	185,953	58,454,038	314	35,856	10,700,054	298
1899	199,138	63,196,746	317	38,049	11,207,967	295
1900	220,031	70,018,418	318	40,303	11,822,059	293
1901	236,769	71,228,774	301	41,923	12,345,184	294
1902	236,543	70,074,738	296	42,036	12,399,577	295

<sup>1</sup> *Berg- Hütten u. Salinen*, 1903, p. 43 ; 1889, pp. 85-6.

operation was twenty-two days. For the same period in the Saar the variation was twenty-four days, in Upper Silesia eleven days, and Lower Silesia twelve days. These results seem quite normal, because the two former districts are dependent in a much greater degree for their activity on the industrial situation. In the Ruhr syndicate the recent crisis necessitated a considerable reduction in output, but, instead of discharging laborers the general practice was to diminish the number of shifts, keeping the pay-rolls practically intact.<sup>1</sup>

Next to wages and regularity of employment, perhaps the most important condition is the length of the labor day. In this respect there is an extraordinary difference in the different mining regions. The ancient,<sup>2</sup> as well as the most modern rule in the Ruhr, is the 8 hour day, but in Upper Silesia 12 hours and even more are not uncommon, but here, it should be said, that an hour is taken out for the midday meal and time in the morning for prayers,<sup>3</sup> etc. One of the alleged abuses in the Ruhr, at the time of the strike in 1890, was that the day had been extended with the development of deep mining by often an hour or more, by not including in the 8 hours the time for going in and out of the mine.<sup>4</sup> The mine-owners offered to compromise on an 8 hour day and a half hour additional for going in and out.<sup>5</sup> The situation in 1889, according to the official record, was as follows: In Dortmund, before the strike (in the spring), generally 9 hours, including going in and out; labor at hot points, 6 hours; after the strike, the same. In the Saar, before the strike, average 10 hours, including going in and out; after

<sup>1</sup> Enquete, p. 258.

<sup>2</sup> Huckinghaus, p. 102.

<sup>3</sup> Huckinghaus, p. 104.

<sup>4</sup> Huckinghaus, p. 102.

<sup>5</sup> Huckinghaus, pp. 102-3.

the strike, 9 hours for large mines and 10 for others; for the last quarter, 8 hours, excluding going in and out. For Upper Silesia, the hours for the last quarter of 1889 varied, from 8 to 12 hours, the proportions being as follows:

8 hours . . . . .	4.1 per cent. of laborers.
10 " . . . . .	32.2 " "
11 " . . . . .	3.1 " "
12 " . . . . .	60.6 " "

For Lower Silesia, the hours and proportions were <sup>1</sup>

8 hours . . . . .	10.2 per cent. of laborers.
10 " . . . . .	89.7 " "
12 " . . . . .	0.1 " "

That the cartells have not had an injurious effect in prolonging the labor day may be seen by comparing these figures with the more complete tables furnished for 1902, which follow.<sup>2</sup>

	Upper Silesia		Lower Silesia		Dortmund		Saar.	
	Laborers, % of total	Hrs.	Laborers, % of total	Hrs.	Laborers, % of total	Hrs.	Laborers, % of total	Hrs.
(a)	10.3	8	67.9	8				
Regular miners.	58.1	10	32.1	10	100	8-9	100	9
	31.6	12	—	—				
(b)	7.2	8	64.5	8				
Other	51.7	10	34.6	10	100	8-9	100	9
underground	41.1	12	0.9	12				
laborers.								
(c)	3.3	8	8.9	8				
Laborers above	35.1	10	49.7	10	100	8-12	100	9.5
ground except	61.6	12	41.7	12				
boys and women.								
(d)	22.9	8	33.1	8				
Boys under	43.5	10	66.2	10	100	6-12	100	7
sixteen years.	33.6	12	0.7	12				
(e)	0.2	8	3.0	8				
Women.	54.6	10	58.7	10	—	—	—	—
	45.2	12	38.3	12				
	8.0	8	49.0	8				
All laborers.	51.3	10	38.8	10	100	6-12	100	9
	40.7	12	12.2	12				

<sup>1</sup> *Berg. Hütten u. Salinen*, 1890, p. 70.

<sup>2</sup> *Berg. Hütten u. Salinen*, 1903, p. 37; (includes going in and out in all cases).

An exhaustive analysis of the conditions of labor would be inappropriate here, but a few points may be noted.<sup>1</sup> Women are forbidden to work underground, and in general the police regulation of the mines is thorough, and appears to be well enforced.<sup>2</sup> The number of fatal accidents have steadily decreased since 1880. The average number in the Ruhr per 1000 men employed has been as follows:<sup>3</sup>

1870 -----	3 777
1880 -----	4.158
1890 -----	2.966
1900 -----	2.367

The mines themselves spend an increasing amount for the benefit of the laborer. One feature of the system in the Ruhr is the construction of laborers dwellings.<sup>4</sup> These are both praised and blamed.<sup>5</sup> The fiscal arrangements in the Saar have been specially praised.<sup>6</sup> It seems that in the external conditions, therefore, the laborer has experienced an improvement.

Writing fourteen years ago, Steinmann-Bucher declared that one of the gains to be expected from the cartells would be a reduction in prices.<sup>7</sup> The coal cartells have not reduced prices, but, before we can answer the question whether their influence in this respect has been disadvantageous to labor through increasing the cost of living, we must answer the question whether the prices would have been higher without them, etc. The same must be said of the indirect effects of a high cost

<sup>1</sup> Buff, p. 236.

<sup>2</sup> Hückinghaus, pp. 1.3-14.

<sup>3</sup> Köhne, p. 193.

<sup>4</sup> Cf. especially Hundt: Arbeiterwohnungen auf den Zechen des Ruhrreviers, *passim*.

<sup>5</sup> Cf. Reichstag, 1900, pp. 343-4.

<sup>6</sup> Abgeord., 1903, p. 1699.

<sup>7</sup> Steinmann-Bucher, Wesen, etc., p. 182.

of coal on other commodities. The duration of high prices must, of course, be taken into account also. The probable answers to these two questions would be that prices would have gone higher, but that they would have declined more quickly. What the net quantitative effect would be no man can say, and it may be regarded as quite doubtful on which side the balance would hang.

Another interesting problem, but one to which at present no very positive answer can be given, is the effect of the coal cartells on the organization of labor. The cartells as such have not interfered with the relations of employer and laborer.<sup>1</sup> Both cartells and unions represent combination as opposed to competition, and the formation of unions may be considered as a counterpoise to the cartells. In the old "Knappschaften" the miners possessed a strong organization,<sup>2</sup> but the modern trades unions are not strong.<sup>3</sup> Apart from the general backwardness of the labor movement in Germany, as compared with England or France, there are special reasons that work against labor organizations, at least in the Ruhr. First, there are differences in nationality, and, second, there are differences in religion. Of the differences in nationality we have spoken elsewhere;<sup>4</sup> the Catholics and Protestants are about equal in number.<sup>5</sup> Another element of discord is the Social Democracy.<sup>6</sup> This lack of organization among the laborers appears to diminish the incentive for a close organization among employers to

<sup>1</sup> Enquete, p. 257.

<sup>2</sup> Oldenburg, p. 328, Arndt.

<sup>3</sup> Huckinghaus, p. 123; Pieper, p. 172; Oldenburg, p. 215; Parteitag, Soc. Dem., p. 165.

<sup>4</sup> See p. 36.

<sup>5</sup> Schneider, p. 32; *J. B. Verein*, Dortmund, 1889, p. 29; Calwer, 1900, pp. 96-7; *Bochum Hk.*, 1894, p. 8.

<sup>6</sup> Huckinghaus, p. 123.

deal with labor questions.<sup>1</sup> Which would be the stronger, in general, when well organized, the unions<sup>2</sup> or the cartells,<sup>3</sup> is a matter on which opinions differ; and the same is true of the question whether on the whole the cartells have been favorable<sup>4</sup> or unfavorable<sup>5</sup> to labor. Prof. Waentig fears that the reconciliation of capital and labor will be fraught with great danger for the consumer.<sup>6</sup> Sarter thought ten years ago that the danger of strikes in the coal industry was increased;<sup>7</sup> the history of the syndicate has, however, been singularly fortunate in this respect, due, doubtless, rather to the good times than any extraordinary merit on the part of the syndicate.

<sup>1</sup> Enquete, p. 252.

<sup>2</sup> Brentano, p. 27; Conrad, p. 246; Grunzel, p. 140; Schoenlank, p. 536.

<sup>3</sup> Bebel, Reichstag, 1902, p. 6134; Hitschmann, p. 11.

<sup>4</sup> E. g. Techierschky, pp. 126-7; Fridrichowicz, pp. 642-3; Landesberger, Juristentag, p. 345; Juliusberg, p. 26; Nentwig, Juristentag, p. 296.

<sup>5</sup> Stieda, *Verein f. Soc. Pol.*, LXI, p. 21; Bücher, *Ib.*, p. 149.

<sup>6</sup> Waentig, p. 31.

<sup>7</sup> Sarter, p. 51.

## PART V

### REGULATION AND REFORM

#### CHAPTER I

##### PRESENT SITUATION

The subject of the regulation of cartells in general does not come within the scope of the present writing, but as the coal cartells are invariably included in these proposals, it is proper that we should consider the general subject briefly, and those proposals which have more particular application to the coal cartells in more detail. Before we consider them, however, we should examine the present status of the cartells in respect to the law.

The civil law in Germany implicitly recognizes the obligation of cartell contracts, because it recognizes the general principle of freedom of contract without making any exception in the case of cartell contracts.<sup>1</sup> The only provision of the code which could be held to put their legality in question is § 138, which declares that contracts that are repugnant to morality are void.<sup>2</sup> The prevailing views of commercial morality, however, find nothing repugnant thereto in cartell contracts *per se*. The law also provides for freedom of occupation,<sup>3</sup> where not otherwise limited by law, but judicial authority has interpreted this as not inconsistent with cartell con-

<sup>1</sup> Cf. Landesberger, Juristentag, p. 350; Menzel, Die Kartelle und die Rechtsordnung, p. 16; Hirsch, Die rechtliche Behandlung der Kartelle, p. 7.

<sup>2</sup> B. G. B., § 138. "Ein Rechtsgeschäft das gegen die guten Sitten verstößt ist nichtig."

<sup>3</sup> Gewerbeordnung, § 1.

tracts restricting such activities.<sup>1</sup> It happens, indeed, that the highest court of the Empire has considered and upheld the validity of the compact between the Rheinisch-Westfälische Kohlen Syndicat and the mine owners (in a dispute respecting the supply of coal by a Hüttenzeche).<sup>2</sup>

The criminal law in Germany declares no prohibition against cartell agreements, as such,<sup>3</sup> though, like contracts between individuals, they may be offensive to the criminal law in certain cases.

Under the administrative law, cartells are free from any control or restriction. The mining industry itself is subject to considerable administrative control, not only in respect to labor and the safety of the same, but also in the initiation of the business, and to some extent in the technical operation.<sup>4</sup> Where mining companies are formed, they come under the provisions of the commercial code (*Handelsgesetzbuch*) and miners themselves, and those employing them, are controlled in many ways by the industrial ordinances (*Gewerbeordnung*). An important provision of the mining law is § 65, which provides that the government may intervene to compel parties holding mining lands to develop and operate the same under penalty of forfeiture.

The regulation of cartells, or the cure of cartell abuses, may be attempted in two ways; first, by law, second, by various politico-economic measures. The

<sup>1</sup> Cf. *Entsch. d. R. G. in Civ. S. Urt. v. 25. Juni, 1890*; see also *Menzel*, pp. 44-6; *Hirsch*, pp. 7-8.

<sup>2</sup> *Entsch. d. R. G. in Civ. S. Urt. v. 19 Feb., 1901, Zeche ver. Hannibal w. Rh.-W. Kohlen Syndicat.*

<sup>3</sup> Cf. *Landesberger, Juristentag*, p. 350; *Menzel*, p. 16; *Hirsch*, p. 10.

<sup>4</sup> *Huckinghaus*, p. 13. Formerly, *i.e.*, before 1852, the State controlled the principal business operations of the companies.



legal regulations are naturally divided into (a) criminal, (b) civil, (c) administrative. The politico-economic measures are not capable of such a simple classification, but they include such measures as the application of the taxing power, especially in connection with customs taxes, the use of the rate-making power in railways, state enterprise, either as a monopoly, or in competition with other producers, etc. In a general examination of the subject, the legal measures would require extended consideration, but that would be out of place here, as there is nothing peculiar about the coal cartells. Only a brief statement of the chief kinds of legal remedies suggested will be given. Among the politico-economic measures, only those will be considered which are of special interest in connection with the coal cartells.

## CHAPTER II

### LEGAL REGULATION

The proposal to cure the evils caused by cartells, by prohibitions of the criminal law are perhaps the first to occur to the reformer, but the least effective of any. There are two objections, either of which is almost fatal; first, prohibition does not prevent, and secondly, the prohibition can be evaded by transforming the cartell into a single company (fusion, trust).<sup>1</sup> It would be impossible, practically speaking, to prohibit large companies in general. Instead of prohibiting cartells, certain acts of cartells may be forbidden, and such provisions in many cases, such as a prohibition of unreasonable prices, could be applied to the fusion as well as the cartell, but, in either case, the practical enforcement might be impossible. A prohibition of the coal syndicate or the convention of Upper Silesia would have resulted probably in a secret cartell of the most powerful producers, and the gradual elimination of the smaller and weaker ones. The tendency to consolidation would have been enormously stimulated, and, even if that were prohibited, it could hardly be prevented in a disguised form through a system of stock ownership. The application of penal laws to a cartell to prevent "excesses" is full of difficulty, practically, and open to very grave objections as a matter of jurisprudence, unless the acts made punishable are such that they would be subject to penalty if committed by a private person.<sup>2</sup>

<sup>1</sup> Cf. Steinbach, pp. 5-7; Klein, Juristentag, p. 301; Urban, p. 8; Grundberg, p. 207; Friedrichowicz, p. 649; Wittelschöfer, p. 128, etc., etc.

<sup>2</sup> Cf. Erlaut. Bemerk., Gesetz-Entwurf, Verbot d. Rübenrayonnirung. Österr. Abgeord. 1678 d. Beilagen, 1903.

Cartells may be legislated against through the civil law. The most radical measure is to declare a cartell contract null and void. Experience has proved, however, that this of little or no practical effect; the Austrian cartells flourish, although they are in exactly this situation.<sup>1</sup> Ordinarily, judicial cognizance of the matter would arise through resort of the members of the cartell to the courts, but this would seldom occur, because commercial honor and business convenience would generally require the fulfilment of the conditions of the compact.<sup>2</sup> Where the law allows action by the public prosecutor, or action by third parties, claiming to be injured, for damages, the position of the cartell may be certainly much more precarious, but history has not shown such remedies to be very effective. Special provisions of the law aiming at abuses of cartells, rather than their existence, have a better chance of success, and are more consonant with the ideas of the age. The German law against unfair competition applies of course to the individual as well as the cartell.<sup>3</sup> Of more practical value, also, are laws which regulate contracts so as to procure a fair degree of equality in determination and obligation.<sup>4</sup>

Cartell reform or regulation through the administrative law aims to accomplish its purpose, generally, either by procuring publicity or by providing administrative supervision and control. One of the simplest, and perhaps the best remedy for cartell abuses, is the requirement of publicity. This may be provided for in various ways, but principally through (1) report of organi-

<sup>1</sup> Cf. Menzel, *Die Kartelle*, p. 51; Landesberger, *Juristentag*, p. 367.

<sup>2</sup> Grunzel, p. 158.

<sup>3</sup> Gesetz zur Bekämpfung des unlauteren Wettbewerbs v. 27 Mai, 1896.

<sup>4</sup> A good illustration is found in §§ 6, 7. Gesetz-Entwurf btr. d. Verbot d. Rübenrayonnirung, etc.

zation and business operations, and (2) public register.<sup>1</sup> Some would make the validity of the cartell depend on registration, others would not. Some oppose publicity on the ground that it is injurious to national economic interests by revealing trade secrets and conditions.<sup>2</sup> More important is the objection that publicity does not constitute a cure; that the cartells committing the greatest excesses have done everything under what may be called the glare of publicity. The Halbzweigverband is cited as a conspicuous instance.<sup>3</sup> This last criticism is of particular interest in connection with the coal and coke syndicates. Almost everything done in the coal syndicate (except export business) has been published far and wide, and probably this fact has had an important influence in giving its policy a more moderate character than most cartells, much more moderate, for example, than the coke syndicate which has been more secret in its methods.

A more far-reaching proposal for administrative control is the proposal for the establishment of a Cartell Bureau with more or less extensive powers of supervision. The Austrian cartell bill and Reich's proposal provided for such a board composed partly of government officials, partly of business men.<sup>4</sup> In both cases, its powers were chiefly advisory and investigatory. Steinbach, Urban and Landesberger prefer a quasi-

<sup>1</sup> Advocated by Menzel, pp. 27, 29; *Prag Hk.*, pp. 126-7; Urban, pp. 26, 28-9; Cartell Comité, Österr. Industrierath, p. 14; Bücher, *Ver. f. Soz. Pol.*; Österr. Cartellgesetzentwurf, pp. 26-7; Landesberger, Juristentag; Liefmann, *Conrad's Jahrb.*, pp. 800-1; Reich, Entwurf, pp. 5, etc., etc.

<sup>2</sup> Kulemann, Juristentag, p. 323; Steinbach, pp. 5-7.

<sup>3</sup> Huber, p. 72.

<sup>4</sup> Österr. Cartellgesetzentwurf, § 11; Reich (Entwurf, §§ 9-11), pp. 4-6; cf. also Klein, Juristentag, pp. 313-16.

judicial organization,<sup>1</sup> but the functions allotted to them are limited chiefly to the verification of reports, etc., and the adjustment of fines for the neglect to comply with the regulations prescribing the same. Huber takes the pessimistic view that the Cartell Bureau would degenerate into a cartell organ, and that, in the fight against the cartells, the first step necessary would be the abolition of the Cartell Bureau.<sup>2</sup>

The important question in establishing a Cartell Bureau is the powers that shall be given it. As long as it is constituted an organ of publicity simply, it can not do much harm, and it may, if properly conducted, be an instrument of far-reaching utility. Knowledge of the facts is certainly a prerequisite to any intelligent action with respect to cartells, and there seems to be no sufficient reason why the industrial interests should be permitted to keep them secret. The German coal cartells profess to be ready to give the government all the available information it requires about their business, and the government, on its side, seems to be perfectly satisfied with the completeness of the information it has obtained. Whether any of the so-called excesses of these cartells would have been prevented, if supervision had been established more systematically and a little earlier, might be questioned, but probably it would have made them more careful.

If, instead of being made merely an organ of publicity, a Cartell Bureau is given large powers of control, the question of its advisability becomes much more problematical, and its conduct and operation vastly more difficult. Two characteristic methods of control are (1) limitation of dividends and (2) price regulation.

<sup>1</sup> Steinbach, pp. 7-8; Urban, pp. 29-30; Landesberger, *Juristentag*, p. 385.

<sup>2</sup> Huber, p. 74.

The limitation of dividends has generally been ineffective, through lack of proper control of the powers of stock-issue and book-keeping, defects which would seem to be remediable. Whether such a limitation is desirable or not is a question that cannot be properly stated or answered in a brief form. Price control attacks the problem even more directly, and may be regarded as the ultimate end of all cartell regulation. It must be regarded certainly as an extreme measure,<sup>1</sup> if undertaken directly. Price regulation by the State has a long, if not a very successful history. The problem of fixing reasonable prices is, indeed, one of enormous difficulty, theoretically as well as practically, and some declare it impossible of solution.<sup>2</sup> Much depends on the definition of the term reasonable price. In a given case of exorbitant prices, a moderately intelligent and informed administrative board could make them *more* reasonable. Whether it is desirable to interfere with the economic order in such a radical manner, and whether the burden imposed on such a body, if the whole industry of the country were drawn under its supervision, would be too much for it, might well be put in question. At any rate it would not seem just to subject a single industry to such control without specially cogent reasons, and no such reasons appear to exist at present in the German coal industry. As a matter of history, the coal industry in Prussia was at one time regulated as respects wages, profits and the amount of production,<sup>3</sup> and the change to a system of private control was deemed desirable both in the interests of the industry and of the public. It is very improbable that a return to the system of state control would benefit either.

<sup>1</sup> Steinbach, pp. 5-7.

<sup>2</sup> Cf. Grunzel, pp. 164-5; Brefeld, Reichstag, 1900, p. 282.

<sup>3</sup> Huckinghaus, p. 11; Menzel, pp. 286, 289.

## CHAPTER III

### ECONOMIC REGULATION

The attempt to cure cartell abuses through economic action may take a great variety of forms. One of the most important is in the way of what may be called financial discrimination, as through taxation, direct and indirect, and railway rates, where the state owns the railways. We need consider only two here, namely, customs taxes and railway rates.

It is often asserted that cartells are dependent on customs protection for their existence, and it is demanded, therefore, that such protective taxes should be abolished. This view of the matter is not correct, as a general proposition, and the German coal cartells serve as a good illustration of the fact, because in Germany there are no protective customs duties on coal. As there is no protection established, the coal cartells could not be attacked in that way. On the other hand, the state might impose an export duty on coal, or even prohibit its export. Such measures would have a very practical bearing in the case of the German coal cartells as they are all largely interested in the export trade, except those producing brown coal. An evident objection to such a measure is one that is applicable to all export taxes, where a country does not possess a dominating position in the commodity to be exported, namely, that it injures national industry.<sup>1</sup> A second serious objection to such a measure is that it falls alike on the "just and the unjust," according to our present hypothesis, the independent as well as the cartelled producer, or the good cartell as well as the bad cartell. Another objection in

<sup>1</sup> Cf. Brefeld, in Reichstag, 1900, p. 281.

the case of Germany is of a technical character, namely, that it would be inconsistent with commercial treaties.<sup>1</sup> The prohibition of coal exports was advocated in Germany at the time of the coal famine,<sup>2</sup> but the Government, as well as the commission appointed to investigate the matter, opposed this demand as injurious to German interests and to the coal industry.<sup>3</sup>

The prohibition of coal exports, or the restriction of them through an export duty, considered simply as a cartell remedy, may have two purposes: (1) to prevent the maintenance of high domestic prices, through an artificial scarcity created by exports, (2) to prevent low export prices for a raw material which may serve to aid foreign competitors.

The weakness of such a measure for the coal industry is seen in the fact that the home supply would not necessarily be increased, because the export production is not to be regarded as so much subtracted from a definite output, but rather as an extra production caused by increased market possibilities. Such an increase in production, at least for short periods, tends to diminish rather than increase costs, and makes possible, at least, a lower scale of domestic prices without reducing the producer's profits. More might be said for this remedy in respect to the second purpose, the prevention of low export prices. If that practice were carried to a great excess and in a way to directly aid foreign competitive producers, such a measure might be expedient in extremity. Looking at the matter from a practical standpoint, however, it may be observed that the concessions made to the foreign consumer are of the same kind as

<sup>1</sup> Reichstag, 1900, p. 354; *Industrie Ztg.*, 1900, p. 434.

<sup>2</sup> Reichstag, 1900, pp. 252, 277.

<sup>3</sup> Brefeld, Reichstag, 1900, p. 281; Abgeord., 1900, p. 856; X Commission, p. 21.



those made to the domestic consumer in remote or competitive markets, and has nothing necessarily anti-national about it, and, secondly, that such low export prices are generally more than counterbalanced by high freight costs or import taxes (*e.g.*, France), and, so far as discoverable, have not been granted in such amounts nor in such a systematic way as to really threaten the national producer. Whether an international arrangement, operating through the customs tax *régime*, could be made effective against coal cartells, in something the same fashion as the Brussels Sugar Convention, is a matter that has not yet become a question for practical consideration, and such an attempt at control could probably be evaded through the organization of international cartells, for which precedents already exist in this branch of industry (Belgian and Westphalian coke syndicates).

Another weapon which may be used against cartells, and which for cheap and bulky commodities like coal is almost as effective as customs restrictions, is possessed by those states which control the railways. Apart from general theoretical discussions, the use of the railway rates has been advocated to control the policy of the coal combinations. For example, in 1890 Messrs. Richter and Schrader proposed in the Reichstag that the import rate and export rate for coal should be made equal, as a check against low export prices.<sup>1</sup> Although the government refused to intervene, the minister, Herr Berlepsch sharply denied the claim of the coal people that the government had nothing to say about their price policy when it came to rate-making.<sup>2</sup> Similar demands were made from various quarters

<sup>1</sup> Effertz (1891), p. 4; *cf.* Kanitz, p. 22.

<sup>2</sup> *Jahresbericht d. Vereins*, 1890, p. 112.

in 1900, especially for the abolition of low export rates.<sup>1</sup> The late Herr von Thielen, as minister of public works (railways), defended the export schedule as necessary and desirable for the coal industry,<sup>2</sup> and, when immediate changes were advocated in 1900, he pointed out that it would be unfair as contracts were formed on the basis of existing rates. The government of Prussia and several other German states agreed, however, to a reduction of the import rate to the scale of the "raw stuff" import rate for a period of two years.<sup>3</sup> The coal syndicate in its annual report for 1901 protested against its continuance, although it asserted, with apparent correctness, that it had had no appreciable effect on the coal trade.<sup>4</sup>

The efficacy of this remedy depends a good deal on circumstances. Normally the cost of transportation is a very significant element in determining the radius of the coal market, and it is partly to overcome this obstacle that systematic price reductions are made in case of sales to distant domestic or foreign markets. But the railway administrations are not perfectly independent in fixing rates, because they must not only meet the competition of other transportation agencies, but they must also put the rates at such figures as will get business, and long distance traffic must be encouraged by low rates, so that the interest of the railway administration is often the same as that of the producer in making a

<sup>1</sup> *Industrie Ztg.*, 1900, pp. 405, 486. A demand was made in the Reichstag for a higher export rate; Heim, Reichstag, 1900, p. 277. In 1891 Herr Kirdorf called attention to the fact that the government had made low rates always on the condition of corresponding reductions in prices for such exports. Huckinghaus, p. 47.

<sup>2</sup> Reichstag, 1900, p. 283; cf. Denkschrift, p. 16.

<sup>3</sup> *Industrie Ztg.*, pp. 405, 413; Calwer, 1900, pp. 84-5; *Mittel-franken Hk.*, 1900, pp. 134-5.

<sup>4</sup> Bericht d. Rh. W. Kohlen Synd., 1901, p. 9.

low export rate. The possibility of checking or controlling the coal cartells through the control of railway rates depends primarily on the location of the coal regions with respect to the means of transportation. Coal districts lying near the border of a country could not be prevented from exporting their product to any great extent without a radical revolution in the rate policy.<sup>1</sup> The general principles of the German rate systems require low export rates and low rates on heavy commodities. To overturn this system would be a questionable course, and it would be equally questionable to make the rate system wholly arbitrary and a matter of power or influence rather than scientific principle. In the case of a large part of the exports from the Ruhr, the railway rates form a relatively small part of the cost of transportation, because the Rhine gives easy access to the principal foreign markets. The Upper Silesian coal fields lie right on the border, and they also have available water transportation into Russia and to the Baltic and North Seas. Further, any attempt to cut off any foreign district from its usual source of supply of German coal (*e. g.*, Bohemia or the French Minette) would probably lead to international complications and perhaps to commercial retaliation. It is evident, also, that this device of correcting cartells would be subject to the drawback of not discriminating between the cartelled and non-cartelled producer, though, as the cartells are in different districts, it might discriminate between the good and bad cartells.

The difficulty in abolishing or controlling cartells

<sup>1</sup>Of course we leave out of consideration any senseless destructive attack on the coal industry. It would be possible, in extremity, to refuse transportation altogether, but there are plenty of radical measures possible which would be much more harmful than the cartells were ever accused of being.

has led some writers to attack the problem from the other side, and to suggest state recognition of cartell monopolies with some voice in their management.<sup>1</sup> The Kali cartell has suggested a solution to some,<sup>2</sup> and the Russian Normirowka to others.<sup>3</sup> The Prussian fiscus is a member of the Kali cartell, and also the fiscus of the Duchy of Anhalt, the former having a participation of 8.12 %, and the latter 7.28 %. Formerly their shares were much larger.<sup>4</sup> The Prussian Minister of trade and industry, Brefeld, naturally commended this institution,<sup>5</sup> but his commendation fell rather flat in face of his objection to the adhesion of the fiscal coal mines of Silesia to the convention, on the ground that they would be "majorisirt",<sup>6</sup> because the voting power of the fiscal mines in the convention would be much stronger than in the Kali cartell. The Coal Commission of 1901 favored the organization of a fiscal syndicate in Upper Silesia.<sup>7</sup> Assuming that a fiscal cartell would be a good thing, it does not seem that it would have much influence, unless it possessed a considerable portion, say 25-30 %, of the production. At present this might be tried in Silesia, but the fiscus does not control enough for such an experiment in the Ruhr.

From a fiscal cartell it is not a very long step to government ownership (nationalization) of the coal fields. It exists, of course, already in the Saar. It has been recommended as a practical reform in a good many quarters, and even by many who oppose the nationali-

<sup>1</sup> Kleinwächter, p. 177, *et seq.*; Weiskirchner, p. 12.

<sup>2</sup> Liefmann, *Unternehmerverbände*, p. 196; Huber, p. 75.

<sup>3</sup> Borger, *Kartell-Rundschau*, p. 245.

<sup>4</sup> *Kartell-Rundschau*, pp. 726-7; Westphal, *Geschichte des Königlichen Salzwirks zu Stassfurt*, *Zeits. f. d. B.-H. u. S.*, 1902, p. 31.

<sup>5</sup> Reichstag, 1900, p. 337.

<sup>6</sup> *Ib.*

<sup>7</sup> X Commission, p. 27.

zation of industries in general.<sup>1</sup> The opposing opinion is quite as respectable.<sup>2</sup> A good many favor a half-way policy, *i. e.*, the acquisition of a considerable portion of the coal lands by the government, with independent action.<sup>3</sup>

The most striking argument made in favor of nationalization of the coal fields is that of Schaeffle, who concludes, however, in an opinion against its general application. The true argument for nationalization proceeds from two grounds; first, the danger of dissipating a vital source of national prosperity, through reckless profit-seeking, private methods of exploitation, and, second, the importance of direct control by the state of an industry, the temporary interruption of which would endanger the national economy and even political safety. In this last respect, Schaeffle finds the peculiar character of the railways and the coal mining industry.<sup>4</sup> Further advantages claimed for state enterprise in coal mining are found in the fact that it is a large, non-speculative industry, that it must be operated by salaried officials in any case, that it affords a practicable means of preventing abuses in selling the output (*e.g.*, low export prices)<sup>5</sup>, that it affords security against strikes, that it improves the situation of labor, etc.<sup>6</sup> The strength of any plea for nationalization depends very much on the

<sup>1</sup> Waentig, Juristentag, pp. 288-9; Bücher, *Ver. f. Soz. Pol.*, p. 156; Grundberg, pp. 209-10; Ofner, *Ver. f. Soz. Pol.*, p. 190; Schleper, pp. 5-6; Reich, Entwurf, p. 24; Bebel, Reichstag, 1902, p. 6125.

<sup>2</sup> For example, Brentano, *Ver. f. Soz. Pol.*, p. 172; Menzel, Juristentag, pp. 288-9; Conrad, p. 248; Arndt, Handwörterbuch, pp. 555-6; Huber, 89; Franz, p. 15; Pohle, pp. 145-6; Grunzel, pp. 166; Huckinghaus, p. 51; Liefmann, *Jahrb. f. Nat. Oek.*, p. 792, etc.

<sup>3</sup> Cf. Schaeffle, pp. 683, 698; Huber, p. 75; Sayous, p. 368; X Commission, 1901, p. 27; Gamp, Reichstag, 1900, p. 350.

<sup>4</sup> Schaeffle, pp. 613-26.

<sup>5</sup> Huckinghaus, pp. 24-6, 47, 61.

<sup>6</sup> Cf. *Industrie Ztg.*, 1900, p. 226.

character of the public administration, and in this respect few states can be compared with Prussia. In Schaeffle's mind the chief objections to nationalization seem to be that it would be against the general historical course of civilization, and that state socialism, if carried far, especially in a country with popular suffrage, is dangerous.<sup>1</sup> Many would sympathize with this view, and find in it the decisive answer to the question. The charge that private exploitation is wasteful is met by the argument that the neglect to work the smaller and poorer coal seams is simply due to the limitations of price and cost, which would exist just as much for the state, if the enterprise were conducted on a self-supporting basis without advancing prices. While there is such a thing as wasteful coal mining, it may be observed that it tends to disappear with the organization of the business in large corporations with extensive coal fields and prospects of a long existence. Considering that the known supply under existing conditions of technique, and with a continuation of the present curve of production, will last at least several hundred years, if not thousands, it is argued that anything else than a reasonable system of commercial exploitation would be absurd.<sup>2</sup> That the laborer would be any better off under state control is vigorously denied,<sup>3</sup> and it is significant, in this connection, that the convention of the Socialist Party in Essen, in 1894, was opposed to the nationalization of coal lands.<sup>4</sup> The strikes in the fiscal Saar seem to have been as bitter

<sup>1</sup> Schaeffle, pp. 644, 689-90.

<sup>2</sup> Cf. Huckinghaus, pp. 59, 62; Gothein, p. 13; Arndt, *Haudwörterbuch*, p. 556.

<sup>3</sup> Brentano, *Ver. f. Soz. Pol.*, p. 1172; Gothein, pp. 26-8; Laur, p. 138; Lenzmann, *Reichstag*, 1900, p. 379.

<sup>4</sup> Laur, p. 139.

and severe as anywhere.<sup>1</sup> Schaeffle asserts that they are not avoidable under any system of social organization, and are more dangerous in the case of state industry.<sup>2</sup> From the financial standpoint, the objections urged to nationalization are that it would be difficult to appraise the coal properties,<sup>3</sup> while, of course, a high price would make a successful and economical operation impossible. It is claimed that at the present day the fiscal mines are not so economically operated.<sup>4</sup> Bueck makes the very pertinent objection that it would be inadvisable to increase those revenues of the government which are independent of parliamentary control, and he points out the fact that the railway has been used as an instrument of taxation.<sup>5</sup> From the foregoing examination of the price policy of the fiscus, it does not appear that state ownership would be of any advantage to the consumer. A considerable improvement in the existing system of state operation would probably result from the introduction of a system of advisory councils, containing representatives of various economic and public interests, such as already exist in the railway service.<sup>6</sup> One of the faults that the Coal Commission of 1901 found with the fiscal system was that it did not keep sufficiently in touch with the market.<sup>7</sup> Two forms of state intervention are considered practicable by Schaeffle, which he describes as institutionalization (*Veranstaltung*) and nationalization (*Verstaatlichung*). The former provides only for the regu-

<sup>1</sup> Bueck, *Industrie Ztg.*, 1900, pp. 226-7.

<sup>2</sup> Schaeffle, pp. 680-1, 689.

<sup>3</sup> Gothein, p. 36.

<sup>4</sup> Lenzmann, *Reichstag*, 1900, p. 379. Laur's data are scarcely admissible, pp. 132, 137.

<sup>5</sup> Bueck, *Industrie Ztg.*, 1900, pp. 226-7.

<sup>6</sup> Schaeffle, p. 694; X Commission, p. 27.

<sup>7</sup> X Commission, pp. 23, 26-7.

lation of the internal technical operations and the relations with labor, leaving the commercial operations untrammelled; the latter provides for complete state ownership and control. Schaeffle prefers the former.<sup>1</sup>

Among the remedies against cartell abuses, we may consider, finally, self-help. If organized, this may take two forms, (1) an anti-cartell, or consumers' association, and (2) a production association. The former, as we have had occasion to observe elsewhere, are specially important in the coal trade, and have been recognized for a long time as an appropriate organization against the cartells.<sup>2</sup> The possibilities of self-help, as well as the most effective methods, depend on circumstances. Those consumers who have the good fortune to be in a competitive region, either do not need it, or can get fair terms by a proper organization.<sup>3</sup> The most effective form of self-help for the consumer is to acquire a direct supply of coal—*i. e.*, a coal mine. This method has been widely and very successfully adopted by the large industrial consumers, especially blast-furnaces, iron-works and shipping concerns. With good organization it could be extended doubtless to include consumers whose individual requirements are not great. But the smaller the consumers' demand, the less important, generally, is the variation in the supply and price of coal, and the greater the difficulty and drawbacks in getting a direct supply.<sup>4</sup>

<sup>1</sup> Schaeffle, pp. 664, 683-690.

<sup>2</sup> Huckinghaus, p. 48.

<sup>3</sup> *Cf.* Enquete, pp. 433-4.

<sup>4</sup> It is a demonstrable fact that many of the manufacturers who cry the loudest over the high price of coal could not show any appreciable difference in profits through an advance of coal prices by 50 per cent.



## CONCLUSION

In the foregoing account, the writer has endeavored to treat the subject in as objective a manner as possible, and to present the facts with a sufficient degree of completeness to enable the reader to draw his own conclusions. For various reasons, which it is not necessary to enumerate here, the writer feels under obligation to present his conclusions on the matter also.

The principal questions which call for a verdict are concerning the policy of the cartells in respect to production and price, the effects on German industry, the position of labor and the need of regulation and reform.

The German coal cartells have not had an injurious influence, in general, on the production of coal. More particularly they cannot be accused, justly, of unduly limiting production among themselves. Nor have they attempted to accomplish the same end by crushing outside competition, by unfair methods. It would be preposterous to say that they have hindered technical progress. The cost of production, on the other hand, probably has been somewhat increased by the preservation of weak and costly mines through participation in the cartells.

In regard to prices, the policy of the coal cartells, on the whole, has been moderate, taking circumstances into consideration, while the policy of the coke cartell may be fairly pronounced extortionate. The prices of coal have been more stable than they would have been under free competition; during the *hausse* they were not screwed up so high as they might easily have been, but, on the other hand, they have not declined so quickly with the *baisse*. The like may be said of the coke

prices, but, at the same time, they were exorbitant considered from the point of view of costs and profits. In this respect a cartell system has the opportunity of greatly improving on free competition, from the point of view of social interest, but conflict of interest in some cases and lack of foresight in others may bring about a policy which is socially more injurious. At present the prices of both coal and coke seem too high, though not exorbitant.

The *déroute* of the iron industry was not due to the coal or coke cartells in any important degree, *i. e.*, even with low prices, disaster to the iron industry would have been inevitable. No other industry was affected so much as iron, and it is at least very questionable whether the cartells in general, (excluding the coal cartells in particular) are to be blamed for the crisis. This question is really beyond the scope of the present inquiry, but the opinion is advanced that most of the cartells helped, on the whole, to produce and to prolong the *hausse*, and among these cartells, undoubtedly, the coal and iron cartells were of great importance. This was due to the fact that they seemed to give a better guarantee of future prosperity. That they are to be blamed for the ill-judged over-development of certain industries, which was apparently the real cause of the crisis, does not seem to be a just conclusion. On the other hand, the cartells may be accused, with more probability of truth, of retarding the convalescence of German industry by not reducing prices, and, if this is true, the coal and coke cartells are specially to blame. In the opinion of the writer, this is very probable in the sense that moderately cheap coal and coke prices, though they might at first have merely stimulated certain consumers to further competitive extravagances, would

have had a distinctly beneficial result on the whole, and, in particular, would have given a sense of relief to the general situation which would have been of more social utility than the satisfaction and confidence which depended on the steadiness of the coal-mining revenues.

So far as the low export price policy is concerned, the writer has already intimated his opinion that its effect on German industry has been greatly exaggerated by its opponents. It seems to have been carried to excess in many instances, but not to such an extent as to seriously affect German industry. This is asserted, of course, only of coal and coke ; for iron manufactures the abuse was much greater. The export premium policy, which was intended to off-set the low export price policy, cannot be considered as an equivalent, although, under the circumstances, a desirable relief.

The policy of the cartells towards the dealers has not developed far enough to make a general judgment appropriate. It may be taken to represent an extension of their monopolistic control, but if the coal cartells did not seize it, the dealers probably would, so that for the general consumer the question is, first, are costs reduced by the elimination of middlemen, and, second, is there any organization possible, to oppose the strict monopoly of sale. To this the answer may be given that the organization of the system of sale certainly offers opportunity for economies in distribution. Appropriate combinations of consumers, though difficult, seem quite within the range of possibility as a useful counterweight to the cartells. In one respect these cartells show on the whole, a virtue too often lacking elsewhere, namely, equal treatment of customers.

In relation to labor the cartells have only an indirect significance, but their history and policy in the coal in-

dustry up to the present date shows nothing of hostility or immediate danger. Nevertheless prudence on the part of the laborer demands thorough organization in the form of trades-unions.

On the whole, we may say that the shortcomings of the coal cartells (even in price policy) have been due rather to weakness of organization or inexperience in management than to inherent defects in the system. Danger and weakness will be present in any form of organization, and the greatest danger with the cartell system is a policy of extortion, and it is often, perhaps generally, a sign of weakness in leadership. The proper price policy of a cartell such as the coal cartells in Germany is not strictly stable prices, but stable prices for definite, limited terms. Permanent prices are an absurdity, owing to the unavoidable changes in cost of production, supply and demand. The cartell should keep prices, where possible, at a point of very moderate profit in periods of industrial depression, and be content with a handsome, though not exorbitant, profit during a boom. In both cases it should respond to the market needs.<sup>1</sup> Hence contracts should be limited at the maximum to a year.

Cartells cannot hope to prevent crises or great changes in the markets. This is obviously true at present, and is also true for any period for which economic predictions as to industrial organization have any scientific or practical value. This is so, because, first, the world is very unevenly developed industrially and commercially and in the organization and co-ordination of these elements; second, there is no possibility of controlling the production of the most funda-

<sup>1</sup> Wages on the other hand (though they should be at all times adequate) ought not to vary with the price of the commodity produced, but according to the market for labor.

mental industry, *viz.*, agriculture ; third, equilibrium of market conditions, or control of market conditions, requires a control of demand as well as supply, and this is not only uncontrollable, but very uncertain ; fourth, controllable accommodations to changes in the market on the side of production must be too slow, owing to the immobility of capital and labor ; fifth, the problem of organization is altogether too vast, even in an isolated state, to say nothing of the infinitely greater difficulties of the whole world.

In respect to regulation and reform, the demand for a greater amount of information seems to be justified and should be insisted upon by the German and Prussian governments. They should have the most complete information, regarding such questions as costs, markets and amounts sold, pooling contracts, exclusive contracts, discriminations in conditions or prices, domestic and foreign, gross and net profits, dividends and wages, etc. This is probably not much in excess of what the governments have actually obtained from the coal cartells. It is not necessary, of course, that all this information should be divulged to the public. The public may claim unconditionally such part of that information as does not affect the property interests of the producers, or the interests of national industry, a wider claim for information should have special justification. Of course, the line here is not definite, nor can it be so from the nature of the case. Hence there must be some administrative discretion.

So far as the German coal cartells are concerned, none of the other remedies proposed seem to promise much *at present*. Criminal and civil legislation are inappropriate. Administrative control, beyond publi-

city, is premature. The economic remedies are either too incomplete, or carry with themselves disadvantages which outweigh the advantages. The acquisition of coal mines in the Ruhr by the Prussian fiscus seems a desirable experiment, and under fortunate conditions of purchase might be carried further, but it must not be regarded so much as a remedy against exploitation of the consumer as a means of making the government freer in supplying its own wants, and in giving it a check on the industry of that region.<sup>1</sup>

Of course it would be unfair and impolitic to single out the cartells in one industry for regulation to the exclusion of others, where equally good grounds for intervention existed. Although the coal cartells have been the most loudly denounced, there does not seem to be sufficient basis in fact for such an invidious distinction.

<sup>1</sup> According to the most recent information, the Prussian fiscus is making a determined effort to buy Hibernia, the third largest coal company, but the financial interests opposed to the entry of the fiscus in that district are equally determined to make it pay a high price for the same. This seems to be a shrewd move, which aims to give the fiscus such a high cost of production that it cannot assume an independent price policy.

## BIBLIOGRAPHICAL REFERENCES WITH FULL TITLES

- Abgeordnetenhaus—Stenographische Berichte ueber die Verhandlungen des Preussischen Hauses der Abgeordneten.
- Aeltesten d. Kaufmannschaft v. Berlin—Bericht ueber Handel und Industrie von Berlin nebst einer Uebersicht des Aeltesten-Kollegiums erstattet von den Aeltesten der Kaufmannschaft von Berlin.
- Arndt : Bergbau und Bergbaupolitik. Leipzig, 1894.
- Arndt : art. Bergbau, Handwörterbuch der Staatswissenschaften, 1899.
- Auswärtiger Handel des Deutschen Zollgebiets.
- Berg-Hütten-u. Salinen—Zeitschrift für das Berg-Hütten und Salinenwesen.
- Bericht d. Cokssyndicats—Geschäfts-Bericht. A. G. Westfälisches Cokssyndicat.
- Bericht d. Kohlensyndicats—Bericht des Rheinisch-Westfälischen Kohlensyndicats.
- Berlin Hk.—Jahresbericht der Handelskammer zu Berlin.
- Berliner Tageblatt.
- Biermer : art. Unternehmervverbände Wörterbuch der Volkswirtschaft.
- Bochum Hk.—Jahresbericht der Handelskammer zu Bochum.
- Brentano : Ueber die Ursachen der heutigen socialen Noth. Leipzig, 1889.
- Breslau Hk.—Jahresbericht der Handelskammer zu Breslau.
- Bücher : Die wirtschaftlichen Kartelle. Schriften des Vereins für Sozial Politik. Bd. 61.
- Brüsseler Vertrag über die Behandlung des Zuckers vom 5 März, 1902, und Entwurf eines Gesetzes wegen Abänderung des Zuckersteuergesetzes mit Denkschrift und Anlagen. Berlin, 1902.
- Buff : Die Gesetze und Verordnung betreffend den Betrieb der Bergwerke in Preussen. Essen, 1894.
- Bulletin Trimestriel de la Société de L'Industrie Minérale. St. Étienne, 1903.
- Calwer : Handel und Wandel.
- Cent. Verb. D. I.—Verhandlungen, Mittheilungen und Berichte des Centralverbandes deutscher Industrieller.
- Coal Trade Journal.
- Cohn : Ein Beitrag zur Geschichte der wirtschaftlichen Kartelle. Archiv für soziale Gesetzgebung und Statistik, 1895.
- Colliery Guardian.
- Comité Central des Houillères de France. Annuaire.
- Conrad : Grundriss zum Studium der politischen Oekonomie. Jena, 1900.

- Cartell Comité—Stenographisches Protokoll, Cartell Comité des Industrierathes. Am 17 April, 1901. (Wien).
- Denkschrift ueber die Kohlenfrage—Denkschrift betreffend die Verhandlungen des Deutschen Reichstages ueber die Kohlenfrage. Bearbeitet vom Verein für die bergbaulichen Interessen im Oberbergamtsbezirk Dortmund. Essen, 1901.
- Denkschrift der Prager Handelskammer—Denkschrift der Handels- und Gewerbekammer in Prag gerichtet an das k. k. Handelsministerium in Betreff der staatlichen Regelung des Cartellwesens. Prag, 1896.
- Denkschrift ueber die Untersuchungen der Arbeiter- und Betriebsverhältnisse in den Steinkohlen-Bezirken. Bearbeitet im Auftrage der Minister der öffentlichen Arbeiten und des Innern. Berlin, 1890.
- Dortmund Hk.—Jahresbericht der Handelskammer zu Dortmund.
- Dortmunder Jahrbuch.—Jahrbuch für den Oberbergamtsbezirk Dortmund. Essen, 1901.
- Dortmunder Zeitung.
- Düsseldorf Hk.—Bericht der Handelskammer zu Düsseldorf.
- Effertz (1891), Was sind "normale" Kohlenpreise? Essen, 1891.
- Effertz (1894), Der niederrheinisch-westfälische Kohlen-Bergbau im I Semester des Jahres, 1894. Essen, 1894.
- Effertz (1895), Die niederrheinisch-westfälische Kohlen-Industrie in ihren Existenz-Bedingungen früher und jetzt. Essen, 1895.
- Enquete—Kontradiktorische Verhandlungen ueber Deutsche Kartelle. Die vom Reichsamt des Innern angestellten Erhebungen ueber das inländische Kartellwesen in Protokollen und stenographischen Berichten.
- Heft 1 : Das Rheinisch-Westfälische Kohlen-Syndicat.
- Heft 2 : Verhandlungen ueber die Oberschlesische Kohlen. Konvention und das Rheinisch-Westfälische Kohlensyndikat.
- Heft 3 : Verhandlungen ueber das Westfälische Kokassyndikat. Berlin, 1903.
- Heft 5 : Verhandlungen über die rheinisch-westfälischen Roheisensyndikate.
- Heft 6 : Verhandlungen über den Halbzeug-Verband. Berlin, 1904.
- Entscheidungen des Reichsgerichts in Civilsachen. Leipzig.
- Essen Hk.—Jahresberichte der Handelskammer für den Kreis Essen.
- Festenberg-Packisch : Bausteine zur Geschichte des deutschen Bergbaus. Leipzig, 1901.
- Frankfurter Zeitung.
- Franz : Die industriellen Syndicate und Cartelle. Berlin, 1902.
- Fridrichowicz : Kartelle. Zeitschrift für die gesamte Staatswissenschaft. 1895.
- Friedrich : Schlesiens Industrie unter dem Einflusse der Caprivischen Handelspolitik, 1889-1900. Berlin, 1902.



- Fechner: Geschichte des schlesischen Berg- und Hüttenwesens. Zeitschrift für das Berg-Hütten-u. Salinen-Wesen, 1902.
- Haacke: Handel und Industrie der Provinz Sachsen, 1889-1899. Stuttgart, 1901.
- Hamburgs Handel.
- Hamburg Hk — Jahresbericht der Handelskammer zu Hamburg. Handels-Museum.
- Heine: Koalitionsrecht und Erpressung. Archiv für Soziale Gesetzgebung und Statistik. Bd. 17. (1902).
- Hirsch: Die rechtliche Behandlung der Kartelle. Jena, 1903.
- Hitschmann: Kartelle und Staatsgewalt. Wien, 1897.
- Huber: Die Kartelle. Leipzig, 1903.
- Huckinghaus: Die Verstaatlichung der Steinkohlenbergwerke. Jena, 1892.
- Gesetz-Entwurf btr. d. Verbot d. Rübenrayonnirung.—Regierungsvorlage. Gesetz vom . . . betreffend das Verbot der Rübenrayonnirung und die Lieferung der zur Zuckererzeugung nöthigen Rübe. 1678 der Beilagen zu den stenogr. Protokollen des (österr.) Abgeordnetenhauses. XVII Session, 1903.
- Glückauf, Berg- und Hüttenmännische Wochenschrift.
- Gotheln: Sollen wir unseren Bergbau verstaatlichen? Breslau, 1890.
- Grossmann: Ueber industrielle Kartelle. Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft, 1891.
- Grünberg: Der oesterreichische Kartellgesetzentwurf. Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft, 1897.
- Gruner and Fuster: Aperçu Historique sur les Syndicats de Vente des Combustibles dans le Bassin Rhenan-Westphalien. Paris, 1898.
- Grunzel: Ueber Kartelle. Leipzig, 1902.
- Hundt: Geschäftliche Lage des Steinkohlen-Bergbaues. Mittheilungen über den niederrheinisch-westfälischen Steinkohlen-Bergbau. VIII Allgemeinen Deutschen Bergmannstag. 1901.
- Hundt: Arbeiterwohnungen auf den Zechen des Ruhrreviers. Ib.
- Industrie-Zeitung. Deutsche Industrie-Zeitung. Organ des Centralverbandes Deutscher Industrieller.
- Jahrbuch für das Bergbau- und Hüttenwesen im Königreich Sachsen.
- Jahresbericht der Landwirtschaftskammer für die Rheinprovinz.
- Jahresbericht des Vereins. Dortmund.—Jahresbericht des Vereins für die bergbaulichen Interessen im Oberbergamtsbezirk Dortmund.
- Juliusberg: Die Kartelle und die deutsche Kartellgesetzgebung. Berlin, 1903.
- Juristentag—Verhandlungen des Sechszwanzigsten Deutschen Juristentages. Berlin, 1903.
- Kanitz-Podangen: Die Kohlen-Verkaufsvereine. Berlin, 1891.
- Kartell-Rundschau. Zeitschrift für Kartellwesen und verwandte Gebiete.
- Kestner: Die deutschen Eisenzölle. Leipzig, 1902.
- Kleinwächter: Die Kartelle. Innsbruck. 1883.

- Kleinwächter : art. Kartelle, Handwörterbuch der Staatswissenschaften. Jena, 1900.
- Köhner : Arbeitsverhältnisse. VIII Allgemeine Deutsche Bergmannstag. 1901.
- Kölnische Volkszeitung.
- Kölnische Zeitung.
- Koepper : In Plutos Reich. Wanderungen durch Schacht und Hütte im rheinisch-westfälischen Industriebezirk. Berlin, o. J.
- Kuhlo : Die Kartellfrage. München, 1903.
- Laur : De l'Accaparement. Paris, 1903.
- Landesberger : Der österreichischen Cartellgesetzentwurf. Zeitschrift für das Privat- und öffentliche Recht der Gegenwart. Bd. 24. 1897.
- Landesberger : Welche Massregeln empfehlen sich für die rechtliche Behandlung der Industrie-Kartelle? Verhandlungen des Sechszwanzigsten Deutschen Juristentages. Berlin, 1902.
- Landwirtschaftskammer für die Rheinprovinz. Jahres-Bericht, 1900.
- Lehr und Frankenstein : Production und Konsumption in der Volkswirtschaft. Leipzig, 1895.
- de Leener : Les Syndicats Industriels en Belgique. Bruxelles, 1903.
- Lexis : art. Steinkohlen, Handwörterbuch der Staatswissenschaften.
- Liefmann : Krisen und Kartelle. Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft. 26 Jahrgang. (Schmoller's Jahrbuch).
- Liefmann : Schutzzoll und Kartelle. Jena, 1903.
- Liefmann : Die Unternehmerverbände. Freiburg, i. B. 1897.
- Liefmann : Was kann heute den Kartellen gegenüber geschehen? Conrad's Jahrbücher. Nov., 1902.
- Liefmann : Zur Frage eines Kartellgesetzes. Soziale Praxis. Jan. 3, 10, 1901.
- Lueger : art. Kohlen, Lexikon der gesamten Technik. Bd. II. Berlin, 1895.
- Lotz : Sonderinteressen gegenüber der Wissenschaft einst und jetzt. Berlin, 1902.
- Lozé : Les Charbons Britanniques. Paris, 1900.
- May : Die Wirtschaft in Vergangenheit, Gegenwart und Zukunft. Berlin, 1901.
- Menzel : Die Kartelle und die Rechtsordnung. Leipzig, 1902.
- Mittelfranken Hk.—Jahresbericht der Handels- und Gewerbekammer für Mittelfranken.
- Monatliche Nachweise u. d. Auswärtigen Handel—Monatliche Nachweise ueber den Auswärtigen Handel des Deutschen Zollgebiets.
- Münchener Allgemeine Zeitung.
- Nationalsozialer Verein, 1902.—Protokoll ueber die Verhandlungen des Nationalsozialen Vereins zu Hannover, 1902. Berlin, o. J.
- Oberbayern Hk.—Jahresbericht der Handels- und Gewerbekammer für Oberbayern.
- Oberschlesischer Anzeiger.

- Oeser: Wie stellen wir uns zu den Kartellen und Syndikaten? Frankfurt a/M. 1902.
- Oesterr. Kartell-Gesetz-Entwurf—Regierungsvorlage . . . ueber Cartelle in Beziehung auf Verbrauchsgegenstände, die einer mit der industriellen Production in enger Verbindung stehenden indirecten Abgabe unterliegen. 154 der Beilagen zu den stenogr. Protokollen des Abgeordnetenhauses. XV Session, 1898.
- Oldenburg: Studien ueber die rheinisch-westfälische Bergarbeiterbewegung. Schmollers Jahrbuch. Bd. 14 (1890).
- Oppeln Hk.—Jahresbericht der Handelskammer für den Regierungsbezirk Oppeln.
- Parteitag, der Sozialdemokratischen Partei, 1894. Protokoll ueber die Verhandlungen des Parteitages der Sozialdemokratischen Partei Deutschlands. Berlin, 1894.
- Perquel: La Crise du Charbon en Allemagne. Paris, 1900.
- Peters: Die finanzielle Entwicklung der preussischen Binnenwasserstrassen. Archiv für Eisenbahnwesen, 1902.
- Philippovich: Grundriss der Politischen Oekonomie. Freiburg, i. B., 1899.
- Pieper: Die Lage der Bergarbeiter im Ruhrrevier. Berlin, 1903.
- Pohle: Die Kartelle der gewerblichen Unternehmer. Leipzig, 1898.
- Prusmann: Denkschrift ueber den Entwurf eines Rhein-Elbe-Kanals. Berlin, 1899.
- Raffalovich: Trusts, cartels & syndicats. Paris, 1903.
- Renaud: Die Bergbau- und die Hüttenindustrie von Oberschlesien. 1884–1897. Stuttgart, 1900.
- Reich: Referententwurf eines Gesetzes, betreffend die Regelung des Cartellwesens. Industrie und Landwirtschaftsrath. Wien, 1901.
- Reichstag, Protokoll: Stenographische Berichte ueber die Verhandlungen des Reichstags.
- Rheinisch-Westfälische Zeitung.
- Riehn: Das Konsumvereinswesen in Deutschland. Berlin, 1902.
- Rosenberg: Das Cartellgesetz. Zeitschrift für Staats- und Volkswirtschaft. Jahrgang, 1897. Juni, 6, 13 u. 27.
- Rottenburg: Die Kartellfrage. Leipzig, 1903.
- Rousiers: Les Syndicats industriels des producteurs en France et à l'étranger. Paris, 1901.
- Saarbrücken Hk.—Jahresbericht der Handelskammer zu Saarbrücken.
- Saling's Börsen Jahrbuch.
- Sarter: Die Syndikatsbestrebungen im niederrheinisch-westfälischen Steinkohlenbezirke. Jahrbücher für Nationaloekonomie und Statistik, 1894.
- Savoye: La Crise du Charbon, 1899–1900. Paris, 1901.
- Sayous: La Crise Allemande de 1900–1902. Le Charbon, Le Fer & L'Acier. Paris, 1903.
- Schacht: Der Stahltrust. Preussische Jahrbücher. 1903.

- Schaeffle: Trennung von Staat und Volkswirtschaft aus Anlass des jüngstens Arbeitmassenaustandes im Kohlenbergbau. Zeitschrift für die gesamte Staatswissenschaft. 1889.
- Schleper: Das Volkseigenthum an den Bergwerken. Wien, 1900.
- Schmoller: Grundriss der allgemeinen Volkswirtschaftslehre. I Leipzig, 1900.
- Schneider: Entwicklung des niederrheinisch-westfälischen Bergbaus und der Eisenindustrie. Bochum, 1899.
- Schoenlank: Die Kartelle. Archiv für Soziale Gesetzgebung und Statistik. 1890.
- Sinzheimer: Ueber die Grenzen der Weiterbildung des fabrikmässigen Grossbetriebes in Deutschland. Stuttgart, 1893.
- Sombart: Der Moderne Kapitalismus. Leipzig, 1902.
- Soziale Praxis.
- Statistisches Jahrbuch—Statistisches Jahrbuch für das Deutsche Reich.
- Statistik d. Oberschles. Berg- u. Hütten.—Statistik der oberschlesischen Berg- und Hüttenwerke. Herausgegeben vom oberschlesischen Berg und Hüttenmännischen Verein. Kattowitz.
- Statut, Cokssyndicat—Statut der A. G. Westfälisches Cokssyndicat vom . . . 31 Okt. 1899.
- Statut, Kohlensyndicat—Gesellschafts-Vertrag (Statut) der A. G. Rheinisch-Westfälisches Kohlensyndicat.
- Stahl und Eisen. Zeitschrift für das deutsche Eisenhüttenwesen.
- Steinbach: Der Staat und die modernen Privatmonopole. Kartell-Rundschau, Heft I. 1903.
- Steinkohlenzechen des niederrheinisch-westfälischen Industriebezirks. 1903. Dortmund 1903.
- Steinman-Bucher: Ausbau des Kartellwesens. Berlin, 1902.
- Steinmann-Bucher: Des Rheinisch-Westfälische Kohlensyndicat. Schriften des Vereins für Sozial-Politik. Bd. LX. Leipzig, 1894.
- Steinmann-Bucher: Wesen und Bedeutung der gewerblichen Kartelle. Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft. 1891.
- Stieda: Kartelle. Schriften des Vereins für Sozialpolitik. Bd. LXI. (1894).
- Sympher: Die wirtschaftliche Bedeutung des Rhein-Elbe Kanals. Berlin, 1899.
- Tachierschky: Kartell und Trust. Göttingen, 1903.
- Uebersicht ueber die auf den Preussischen Staatseisenbahnen im Güterverkehr bestehenden Ausnahmetarife, 1901.
- Urban: Bericht des Referenten enthaltend Vorschläge für eine gesetzliche Regelung des Kartellwesens in Oesterreich. Industrie und Landwirtschaftsrath, Wien, 1901.
- Vertrag, Cokssyndicat u. Kohlensyndicat.—Vertrag zwischen der A. G. Rheinisch-Westfälisches Kohlensyndicat zu Essen und der A. G. Westfälisches Cokssyndicat zu Bochum. 1897.

- Vertrag, Kohlensyndicat—Wortlaut des Vertrages zwischen der A. G. Rheinisch-Westfälisches Kohlen-Syndicat und den zum Syndicat gehörigen Zechen sowie zwischen den letzteren untereinander. 1895.
- Verzeichnis der Bergwerke, Salinen, industriellen Werke und Ortschaften nach ihrer Lage auf der "Industrie und Verkehrskarte des Niederrheinisch-Westfälischen Industriebezirks. Essen.
- Verzeichnis der Vereine gewerblicher Unternehmer—Verzeichnis der im Deutschen Reiche bestehenden Vereine gewerblicher Unternehmer. Berlin, 1903.
- Vierteljahrshefte — Vierteljahrshefte zur Statistik des Deutschen Reichs.
- Villain : *Le fer, la houille, et la métallurgie*. Paris, 1901.
- Voelcker : Bericht über das Kartellwesen in der inländischen Eisenindustrie. Berlin, 1903.
- Vogelstein : Die Industrie der Rheinprovinz, 1888–1900. Stuttgart, 1902.
- Waentig : Industriekartelle und Trusts und das Problem ihrer rechtlichen Regelung. Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft. Bd. 25 (1901).
- Weiskirchner : Das Cartellwesen vom Standpunkte der christlichen Wirtschaftsauffassung. Wien, 1896.
- Wieser : Die rheinisch-westfälische Eisenindustrie in der gegenwärtigen Krisis. Schmoller's Jahrbuch. Bd. 26 (1902).
- Wittelshöfer : Der österreichische Kartellgesetzentwurf. Archiv für soziale Gesetzgebung und Statistik. Bd. 13 (1899).
- X. Kommission—Bericht der X. Kommission zur Vorberathung des Antrages Dr. v. Korn-Rudelsdorf und Genossen betreffend die Missstände bei dem Verschleiss der Kohlenproduktion, Nr. 12 der Drucksachen. Haus der Abgeordneten, 19 Legislaturperiode III Session 1901. Nr. 145.
- Zeitschr. f. Braunkohlen—Zeitschrift für Gewinnung und Verwertung der Braunkohlen.
- Zeitschr. Oberschles. Berg- und Hütt. Ver.—Zeitschrift des Oberschlesischen Berg- und Hüttenmännischen Vereins.
- Zeitschr. Preuss. Stat. Bureaus. Zeitschrift des Königlich Preussischen Statistischen Bureaus.
- Zeitung des Vereins Deutscher Eisenbahn-Verwaltungen.

# PUBLICATIONS OF THE AMERICAN ECONOMIC ASSOCIATION

## VOLUME II, 1897

- Ninth Annual Meeting: Hand-Book and Report. Pp. 162. .50
1. Economics and Jurisprudence. By Henry C. Adams. Pp. 48. .50
  2. The Saloon Question in Chicago. By John E. George. Pp. 62. .50
  3. The General Property Tax in California. By Carl C. Plehn. Pp. 88. .50
  4. Area and Population of U. S. at Eleventh Census. By W. F. Willcox. Pp. 60. .50
  5. A Discussion Concerning the Currencies of the British Plantations in America, etc. By William Douglass. Edited by C. J. Bullock. Pp. 118. .50
  6. Density and Distribution of Population in U. S. at Eleventh Census. By W. F. Willcox. Pp. 79. .50

## VOLUME III, 1898

- Tenth Annual Meeting: Hand-Book and Report. Pp. 136. .50
1. Government by Injunction. By William H. Dunbar. Pp. 44. .50
  2. Economic Aspects of Railroad Receiverships. By H. H. Swain. Pp. 118. .50
  3. The Ohio Tax Inquisitor Law. By T. N. Carver. Pp. 50. .50
  4. The American Federation of Labor. By Morton A. Aldrich. Pp. 54. .50
  5. Housing of the Working People in Yonkers. By Ernest L. Bogart. Pp. 82. .50
  6. The State Purchase of Railways in Switzerland. By Horace Michelié; translated by John Cummings. Pp. 72. .50

## VOLUME IV, 1899

- Eleventh Annual Meeting: Hand-Book and Report. Pp. 126. .50
1. I. Economics and Politics. By A. T. Hadley. II. Report on Currency Reform. III. Report on the Twelfth Census. Pp. 70. .50
  2. Personal Competition. By Charles H. Cooley. Pp. 104. .50
  3. Economics as a School Study. By Frederick R. Clow. Pp. 72. .50
  - 4-5. The English Income Tax. By J. A. Hill. Pp. 162. 1.00
  - 6 (and last).\* The Effects of Recent Changes in Monetary Standards upon the Distribution of Wealth. By Francis S. Kinder. Pp. 91. .50
- Price of the Economic Studies \$2.50 per volume in paper, \$3.00 in cloth. The set of four volumes, in cloth, \$10.00.

## NEW SERIES

1. The Cotton Industry. By M. B. Hammond. Pp. 494. (In cloth \$2.00.) \$1.50
  2. Scope and Method of the Twelfth Census. Critical discussion by over twenty statistical experts. Pp. 525. (In cloth \$2.50.) 2.00
- Both volumes, in cloth, \$4.00.

## THIRD SERIES

### VOLUME I, 1900

1. Twelfth Annual Meeting: Papers on Trusts (3); Railroad problems (3); Economic theory (3); Public finance (2); Consumers' league; Twelfth census. Pp. 286. 1.00
2. The End of Villainage in England. By T. W. Page. Pp. 99. 1.00
3. Essays in Colonial Finance. By members of the Association. Pp. 303. 1.50
4. Currency and Banking in the Province of the Massachusetts Bay. By A. McF. Davis. Part I: Currency. Pp. 484 + 19 photogravure plates. (In cloth \$2.00.) 1.75

### VOLUME II, 1901

1. Thirteenth Annual Meeting: Papers on Commercial education (3); Economic theory (3); Taxation of quasi-public corporations (2); Porto Rican finance; Municipal accounts. Pp. 300. 1.25
2. Currency and Banking. By A. McF. Davis. Part II: Banking. Pp. 341 + 18 photogravure plates. (In cloth \$2.00.) 1.75
3. Theory of Value before Adam Smith. By Hannah R. Sewall. Pp. 132. 1.00
4. Administration of City Finances in U. S. By Frederick R. Clow. Pp. 144. 1.00



# PUBLICATIONS OF THE AMERICAN ECONOMIC ASSOCIATION

## VOLUME III, 1902

1. Fourteenth Annual Meeting: Papers on International trade (3); Industrial policy (2); Public finance (2); Negro problem; Arbitration of labor disputes; Economic history. Pp. 400. *1.50*
2. The Negro in Africa and America. By Joseph A. Tillinghast. Pp. 220. (In cloth, \$1.50.) *1.25*
3. Taxation in New Hampshire. By Maurice H. Robinson. Pp. 232. *1.25*
4. Rent in Modern Economic Theory. By Alvin S. Johnson. Pp. 136. *.75*

## VOLUME IV, 1903

1. Fifteenth Annual Meeting: Papers on Trades Unions (4); Railway Regulation (2); Theory of Wages; Theory of Rent; Oriental Currency Problem; Economics and Social Progress. Pp. 298. *1.25*
2. Ethnic Factors in the Population of Boston. By Frederick A. Bushee. Pp. 171. *1.00*
3. History of Contract Labor in the Hawaiian Islands. By Katharine Coman. Pp. 74. *.75*
4. The Income Tax in the Commonwealths of the United States. By Delos O. Kinsman. Pp. 134. *1.00*

## VOLUME V, 1904

Sixteenth Annual Meeting. Papers and Proceedings to be published in two parts.

1. PART 1—Papers and Discussions on Southern Agricultural and Industrial Problems (7); Social Aspects of Economic Law; Relations Between Rent and Interest. Pp. 240. *1.00*  
Southern Economic Problems—reprinted from part 1. *.50*  
Relations Between Rent and Interest. By Frank A. Fetter and others. Reprinted from part 1. *.50*
2. PART 2—Papers and Discussions on The Management of the Surplus Reserve; Theory of Loan Credit in Relation to Corporation Economics; State Taxation of Interstate Commerce; Trusts; Theory of Social Causation. *1.00*  
Theory of Social Causation. By Franklin H. Giddings and others—reprinted from part 2. *.50*
3. Monopolistic Combinations in the German Coal Industry. By Francis Walker. Pp. 340. *1.25*
4. The Influence of Farm Machinery on Production, Prices, and Labor. By Hadley Winfield Quaintance. (*In preparation*).

The entire Publications, 1886-1903, viz., first series, new series, Economic Studies, and third series, vols. 1-4, twenty-one volumes, in cloth, \$66.00. Special price to libraries on application. The supply of complete sets is now below fifty.

The price of the Third Series by volumes is the same as that of the first series; see above.

Cloth bound volumes will be sent, prepaid, to members, for 75 cents each, in exchange for unbound numbers, returned to the Secretary prepaid, and in good condition. Copies in half morocco are 50 cents per volume more than those in cloth.

Separate subscriptions by non-members, libraries, etc., \$4.00 per year. Any single monograph may be obtained at the price given above. One-sixth discount to members and subscribers on all orders.

The American Economic Association, founded, among other purposes, for "the encouragement of economic research," and "the encouragement of perfect freedom of economic discussion," has nearly a thousand members, including public and professional men and most of the leading students of political economy in America. Membership dues are three dollars a year. Each member receives all current reports and publications of the Association.

Address applications for membership, subscriptions, and inquiries to the

SECRETARY of the AMERICAN  
ECONOMIC ASSOCIATION,  
Ithaca, N. Y.

Address all orders except subscriptions to the publishers,

THE MACMILLAN CO.,

66 Fifth Avenue, New York.

**PUBLICATIONS**  
**OF THE**  
**AMERICAN ECONOMIC ASSOCIATION**

---

**THIRD SERIES.**  
**VOL. V, NO. 4.**

---

**ISSUED QUARTERLY.**  
**PRICE, \$4.00 PER YEAR.**

---

**THE INFLUENCE OF FARM MACHINERY**

**ON**

**PRODUCTION AND LABOR**

**BY**

**H. W. QUAINANCE, D.C.L., PH.D.**

---

**NOVEMBER, 1904**

---

**PUBLISHED FOR THE**  
**AMERICAN ECONOMIC ASSOCIATION**  
**BY THE MACMILLAN COMPANY**  
**NEW YORK**  
**LONDON: SWAN SONNENSCHN & CO.**



**Harvard College Library**  
**June 12, 1914**  
**Gift of**  
**Prof. F.W. Taussig**  
**Cambridge**

Copyright, 1904, by  
**AMERICAN ECONOMIC ASSOCIATION**

**PRESS OF**  
**ANDRUS & CHURCH**  
**ITHACA, N. Y.**

**Harvard College Library**

June 12, 1914

Gitt o

Prof. F. N. C. uss g

Cambridge

## PREFACE

The subject of this thesis was suggested to me by my former teacher, Professor David Kinley, of the University of Illinois. Credit for helpful suggestions and inspiration is due also to Col. Carroll D. Wright, formerly U. S. Commissioner of Labor; to Professor I. P. Roberts, of Cornell University; to the members of Professor Ely's seminary in economics in the University of Wisconsin, during the school-year 1902-03; and to the members of the Publication Committee of the American Economic Association. To Professor M. B. Hammond, now of the Ohio State University, I am indebted not only for helpful suggestions made during the two years I was a student in the University of Illinois, but also for a most severe yet kindly criticism of the paper after I thought I had it finished.

In the preparation of the paper I have been careful to avoid trying to prove a theory, preferring rather to let the data tell their own story.

H. W. QUAINANCE.

University of Missouri,  
Columbia, Mo.



## TABLE OF CONTENTS

---

### PART I.—HISTORICAL SURVEY

	PAGE
When the change from hand to machine methods took place.....	1
Hand methods compared with machine methods.....	2
Output of farm machinery .....	11

### PART II.—MACHINERY AND PRODUCTION

Chap. 1. The course of agricultural production contrasted with the increase in the population, 1840-1900 .....	12
The principal crops as shown by the reports of the Census .....	12
The relative growth of the population and the cereal production .....	13
Chap. 2. Concerning the increase in cultivated area per farm worker and the greater effectiveness of farm workers when aided by machinery as shown by statistics of the Census .....	15
Chap. 3. Concerning the greater effectiveness of farm workers when aided by the use of machinery as shown by statistics of the Department of Labor.....	19
Chap. 4. The cost of production by hand and by machine methods	23
Certain of the principal crops .....	25
Farm crops generally .....	26
Chap. 5. Influence of machinery upon fluctuations in quantity of product .....	27
Chap. 6. Influence of machinery upon the quality of products..	28

### PART III.—MACHINERY AND LABOR

Chap. 1. The saving of labor.....	29
Labor saving effect of machinery in the production of the nine principal crops .....	29
Chap. 2. The displacement of labor.....	30
The absolute displacement .....	31
In all farm work in the New England States.....	31
In the work of producing the nine principal crops	32
The relative displacement.....	34
In the different geographical divisions of the country	34
Extent of the relative displacement.....	36
The shifting of the people among the different occupation classes.....	37

Machinery the cause of displacements.....	39
The displaced workmen.....	40
Effect of machinery upon the number of persons in gainful occupation classes.....	42
Chap. 3. The agricultural work of former times in the towns of to-day.....	43
Chap. 4. The influence of machinery upon the size of farms and the resulting relationship between the dependent and independent farming classes.....	47
The average acreage of all land per farm.....	47
The average acreage of improved land per farm.....	48
The average acreage in crops per farm.....	49
The influence of machinery in the seven leading ce- real-producing States.....	51
The average crop acreage per farm.....	54
The average crop acreage per person.....	55
Relative growth of the dependent and independent classes.....	55-56
Average value of farms.....	58
Chap. 5. Wages under hand and under machine methods of pro- duction.....	59
Daily wages.....	59
The position of the unskilled workman.....	62
Monthly wages.....	64
In time of hand methods.....	64
For the period 1866-1902.....	65
Sympathetic variations in wage rates.....	68
Chap. 6. The influence of machinery upon the life and general welfare of the independent farm operators.....	69
The improved condition of farm workers generally..	69
The work of women on farms.....	74
Chap. 7.-The influence of machinery upon the physical and men- tal nature of man.....	75
The purpose and effect of the use of machinery.....	75
Effect upon population.....	76
Routine work.....	78
The educating influence of machinery.....	81
Illiteracy and injuries due to the use of machinery in North Atlantic and Southern States as shown by re- turns of the Twelfth Census.....	83
Chap. 8. The use of machinery and the length of the working day	84
The purpose of the employer and the employee.....	84
The best length of working day for a machine.....	86
The best length of the working day for a man.....	86
The conflict of interest.....	89
The length of the working day on farms.....	90
Economic forces as affecting conditions of employment	91

TABLES OF REFERENCE

I. Total number of persons, ten years of age and over in the several occupation classes in 1870, 1880, 1890 and 1900....	93
II. Total number of males, ten years of age and over in the several occupation classes in 1870, 1880, 1890 and 1900 ..	94
III. Total number of females, ten years of age and over, in the several occupation classes in 1870, 1880, 1890 and 1900 ..	95
IV. Per cent. of persons in the several occupation classes of the total number of persons in occupation classes in 1870, 1880, 1890 and 1900.....	96
V. Per cent. of males in the several occupation classes of the total number of males in occupation classes in 1870, 1880, 1890 and 1900.....	97
VI. Per cent. of females in the several occupation classes of the total number of females in occupation classes in 1870, 1880, 1890 and 1900 .....	98
VII. Farming population in 1880, 1890 and 1900.....	99
VIII. Farming population in the seven leading cereal producing States in 1880, 1890, and 1900.....	100
IX. Agricultural population of New England in 1880, 1890 and 1900 .....	101
X. Acreage in all farm crops as reported in 1880, 1890, and 1900.....	102
Index .....	105



## PART I

### HISTORICAL SURVEY

History tells of no time when farming was not a recognized occupation, when men have not toiled and sweated to wring from the soil their chief sustenance, and yet, it is only within the past hundred years that any considerable progress has been made in the invention of farm labor-saving machinery. There are scattered mentionings of earlier attempts to improve the means of doing farm work; as, for example, a passage in the writings Pliny the elder, in which he describes a machine propelled by oxen and used by the Gauls for cutting grain.<sup>1</sup> But such notices are rare, and whatever the merits of the various inventions, they seem not to have been perfected or at any rate not to have come into common use. The Independence of America found the farmers of Europe, as well as of this country, cultivating and caring for their crops by pretty much the same rude means and methods as were practiced by the Egyptians and Israelites three thousand years before.

As to just when the modern machine methods came into general use authorities differ and will, doubtless, continue to differ. The census statistician for agriculture makes the statement that "The year 1850 practically marks the close of the period in which the only farm implements and machinery, other than the wagon, cart, and cotton gin, were those which, for want of a

<sup>1</sup>"In the vast domains of the provinces of Gaul a large, hollow frame, armed with teeth and supported on two wheels, is driven through the standing corn, the beasts being yoked behind it; the result being that the ears are torn off and fall within the frame."—Pliny's Natural History; Bohn's Classical Library, Vol. IV, p. 103.



better designation, may be called implements of hand production."<sup>1</sup> This opinion is in substantial agreement with that of a recent German writer.<sup>2</sup>

The cotton gin was not invented until nearly twenty years after the Declaration of Independence was signed, and the wagons and carts of that time were crude affairs in comparison with those of the present day.<sup>3</sup> "The Massachusetts farmer who witnessed the revolution plowed his land with the wooden bull-plow, sowed his grain broadcast, and, when it was ripe, cut it with a scythe, and thrashed it out on his barn floor with a flail."<sup>4</sup> The poor whites of Virginia, in 1790, lived in log huts "with the chinks stuffed with clay; the walls had no plaster; the windows had no glass; the furniture was such as they had themselves made. Their grain was thrashed by driving horses over it in the open field. When they ground it they used a rude pestle and mortar, or, placed in the hollow of one stone, they beat it with another."<sup>5</sup>

"In parts of Pennsylvania, in Delaware, the eastern shores of Maryland and Virginia and, we believe, in Rhode Island grain was generally trodden out by oxen

<sup>1</sup>Twelfth Census, Agriculture I, p. xxix.

<sup>2</sup>"Andererseits ist der landwirtschaftlichen Maschinenentwicklung vor dem neunzehnten Jahrhundert wenig Bedeutung beizumessen, da ihre praktische Anwendung mit ihr nicht Hand in Hand gegangen war. Daher kommt es auch, dass die Maschinen der vorigen Jahrhunderte alle mehr oder weniger unvollkommen blieben. Die Anwendung landwirtschaftlicher Maschinen erfolgte erst in grösseren Masstab um die vierziger Jahre dieses Jahrhunderts."—Bensing: Einfluss der landwirtschaftlichen Maschinen, p. 16.

<sup>3</sup>Mass. Agr. Report for 1853, p. 422.

<sup>4</sup>McMaster: History of the People of the United States, Vol I., p. 18.

<sup>5</sup>McMaster: History of the People of the United States, Vol. II, p. 14.

or horses as the more expeditious method," even later than the year 1800. "Horses were preferred for this work. A crop of three thousand bushels could thus be threshed and secured . . . . in ten days. . . . The treading floors were from forty to one hundred and thirty feet, more commonly sixty to one hundred feet in diameter with a path twelve to fourteen feet wide near the periphery upon which the grain was laid. The horses were led round at a slow trot in platoons equidistant from each other . . . . The floors were sometimes removed from field to field, but permanent floors made hard and smooth, and kept so by careful use, were preferred. They were commonly fenced round, sometimes with an outer and inner fence."<sup>1</sup>

Of the Georgia estates in 1790, it is said: Their "chief products were negroes, rice, and tobacco . . . . The staple was tobacco, and this was cultivated in the simplest manner with the rudest of tools. Agriculture as we now know it can scarcely be said to have existed. The plough was little used. The hoe was the implement of husbandry. Made at the plantation smithy, the blade was ill-formed and clumsy; the handle was a sapling with the bark left on . . . . Few roads were ever marked by the tires of a four-wheeled wagon or a tumbrel. When the tobacco was ready for the inspector's mark, stout hogsheads were procured, the leaves packed in, the heads fastened in, a shaft and a rude axle attached, and, one by one they were rolled along the roads for miles to the tobacco-house nearest by."<sup>2</sup> Michaux, who made a journey through the United States in 1802 for the express purpose of study-

<sup>1</sup> Preliminary Report, Eighth Census, p. 95.

<sup>2</sup> McMaster: *History of the People of the United States*, Vol. II, p. 4.

ing agricultural conditions, in speaking of North Carolina, says: "Throughout the whole of the low country the agricultural labours are performed by negro slaves, and the major part of the planters employ them to drag the plough; they conceive the land is better cultivated and calculate besides that in the course of a year a horse, for food and looking after, costs ten times more than a negro, the annual expense of which does not exceed fifteen dollars."<sup>1</sup>

Even so late as the year 1812, the French settlers in Southern Illinois were using plows "made of wood with a small point of iron fastened upon the wood by strips of rawhide, the beam resting upon an axle and small wooden wheels. They were drawn by oxen yoked by the horns by raw leather straps, a pole extending back from the yoke to the axle." Small plows for plowing between the rows of corn were not introduced until about the year 1815. "They used carts that had not a particle of iron about them."<sup>2</sup>

The Cary plow, which seems to have been a fair type of the plows used during later colonial times and until well into the nineteenth century had a "wrought iron share, wooden landside and standard, and wooden mould board plated over with sheet iron or tin and short upright handles."<sup>3</sup> The Old Colony plow, which was still in general use in the Eastern States in 1820, "had a ten-foot beam and a four-foot landside" and it made the "furrows stand up like the ribs of a lean horse in the month of March."<sup>4</sup>

<sup>1</sup> F. A. Michaux, *Travels in America* in 1802, p. 291.

<sup>2</sup> *Mass. Agr. Report* for 1873-4, p. 18.

<sup>3</sup> Eighth Census, Agriculture, p. xviii. *Mass. Agr. Report* for 1853, p. 422.

<sup>4</sup> *Year Book, Department of Agriculture* (1899), p. 315.

One plow, in particular, is deserving of notice. It is the plow which Daniel Webster, in the year 1836, designed and helped to make for the especial purpose of clearing up a certain field on his farm at Marshfield, Massachusetts.<sup>1</sup> It was designed to cut a furrow from 12 to 14 inches deep and has been described as being "12 feet long from the bridle (*i. e.*, clevis) to the tip of the handles; the landside is 4 feet long; the bar and share are forged together; the mould board is of wood with straps of iron; breadth at heel of mould board to landside, 18 inches; the spread of the mould board was 27 inches; the lower edge of the beam was 2 feet 4 inches above the sole; width of share 15 inches." With oxen to draw the plow and several men to help him, Webster held the handles and cleared his stump patch. Speaking of his work with this plow, Webster is reported to have said: "When I have hold of the handles of my big plow in such a field as this, with four yoke of oxen to pull it through and hear the roots crack and see the stumps all go under the furrow, out of sight, and observe the clean mellow surface of the plowed land, I feel more enthusiasm over my achievement than comes from my encounters in public life at Washington."<sup>2</sup>

Webster's plow, although no doubt somewhat exceptional by reason of its massiveness, as became the man, is in fact, only an illustration of what was an every-day affair. For, the blacksmith shops were the plow factories of that time, and farmers were accustomed to having their plows made to order.

It must not be supposed, however, that inventors of the regular type were unmindful of the needs of the

<sup>1</sup> A picture of this plow is given in Roberts: *Fertility of the land*, page 49.

<sup>2</sup> N. Y. Agr. Report, 1867, p. 484.

farming class. The Napoleonic wars, in particular, stimulated the demand of Europe for American agricultural products and our patent office records furnish ample evidence of the efforts of inventors to supply better means of cultivating and caring for such products.<sup>1</sup> Whitney's cotton gin patented in 1794, was only one of many devices designed to promote the business of the farmer. At least two patents for grain thrashing machines were issued as early as the year 1791.<sup>2</sup> A patent for a corn planting machine was issued in 1799<sup>3</sup> and another for a grain cutting machine in 1803.<sup>4</sup>

But the only one of these early inventions, other than the cotton gin, which seems to have really foreshadowed its successor of the present day, was a cast-iron plow invented by Chas. Newbold of Burlington County, New Jersey. Sometime between 1790 and 1796, Newbold had a plow cast, under his direction, at the Hanover furnace, in Burlington County, New Jersey. The plow was cast all "in one peice" and on June 17, 1797, he was granted a patent for his invention.<sup>5</sup> He appears to have used this first plow on his own land with much success; but, financially, his enterprise was a failure. The farmers were opposed to "new fangled notions" and contended that the use of cast iron "poisoned the land, injured its fertility, and promoted the growth of weeds." Finally the point of the plow was broken off. It was never repaired, and the plow is now in the museum of the New York State Agricultural Society at Albany,

<sup>1</sup> Eighth Census, Preliminary Report, p. 96.

<sup>2</sup> Eighth Census, Preliminary Report, p. 96.

<sup>3</sup> U. S. Agr. Report for 1870, p. 401.

<sup>4</sup> Eighth Census, Agriculture, p. xx.

<sup>5</sup> U. S. Agr. Report (1870), p. 395; N. Y. Agr. Report (1867), p. 448.

New York.<sup>1</sup> Eventually, however, the prejudice against cast iron plows was overcome. Better patterns were devised. They were adopted by the people and so late as the year 1850, according to the Census statistician for Agriculture, "The old cast iron plows were in general use. Grass was mowed with the scythe, and grain was cut with the sickle or cradle and thrashed with the flail."<sup>2</sup>

The prototype of the modern grain reaper had indeed appeared prior to 1850.<sup>3</sup> A similar statement might, doubtless, be made concerning certain other inventions for which patents had been issued; but all of these, like the submarine boat and the flying machine of the present day, were in too imperfect a state, too complex, or too expensive to meet the demands of the time. Whitney's cotton gin and Newbold's cast iron plow may, therefore, be accepted as the only ones of the great inventions which, up to 1850, had become thoroughly incorporated into the agricultural industry of this country.

Just how soon after 1850 the various other labor saving machines became essential factors in the business of farm work it would be impossible to tell. Reaping machines were fairly well developed; but the complexity of the machines and the ignorance of the farmers were serious hindrances to their general use.<sup>4</sup> It is only in

<sup>1</sup> N. Y. Agr. Report (1867), pp. 446, 448.

<sup>2</sup> Twelfth Census, Agriculture, Vol. 1, p. xxix.

<sup>3</sup> Obed Hussey's machine was patented in 1833; C. W. McCormick's in 1834.—Eighth Census, Agriculture, p. xxi.

<sup>4</sup> "I use for reaping only the scythe and cradle. . . . Perhaps a still greater benefit may be found in the substitution of reaping machines, which, even now, are used by most of the good farmers of my neighborhood. But because of their great liability to get out of order, the difficulties of working them, and especially my own ignorance of machinery, I have feared to attempt the use of reaping machines."—Letter of Edmund Ruffin, a Virginia farmer. Patent Office Reports (1850-51), p. 104.

very recent years that agricultural implement dealers have ventured to send out any reaping machine without sending also an expert operator to instruct the purchaser in its use.<sup>1</sup>

The two-horse corn cultivator began to come into use in 1861.<sup>2</sup> There are evidences, too, that other farm machines were coming into use at that time.<sup>3</sup> But during the Civil War from 1861 to 1864 the minds of inventors as well as of the working classes were given to other matters.<sup>4</sup>

From 1866 onward progress in the invention and use of agricultural machinery has been by more rapid strides, yet even so late as the year 1870 the editor of the "New American Farm Book"<sup>5</sup> questioned the advisability of using the large threshing machines because of the "great loss of grain and enormous waste of straw," which were apt to result, and cautioned his readers particularly against "employing itinerate threshers, who go about the country to do work." For the "moderate farmer" he advised the use of "a small single or double horse machine or hand thresher" as the more economical and as permitting the work to be done "in winter, where there is more leisure for it."

To-day the American farmer who does not use a machine of some sort is indeed far behind the times. The farmers of the far West have profited most of all.

<sup>1</sup> Report of the Industrial Commission, Vol. XI, p. 78.

<sup>2</sup> "Illinois Farmer" for 1861, p. 178.

<sup>3</sup> Eighth Census, Preliminary Report, p. 99.

<sup>4</sup> The Patent Office records through the period of the Civil War show a marked decrease in the number of patents issued for agricultural implements and machiues and a very great increase in the number of patents issued for firearms and other weapons of warfare.

<sup>5</sup> R. A. Allen's "New American Farm Book" (published in 1870), p. 150.

There, on the California and Oregon farms, may be found fifty-horse-power traction engines in operation. Each one dragging "sixteen ten-inch plows, four six-foot harrows, and a press drill for planting seed-wheat. In this way one such engine performs the triple work of ploughing, harrowing, and planting, all in one operation. The saving of time is so great that one machine can plant with wheat, from fifty to seventy-five acres in a single day, mounting hilly and rough ground just as easily as when passing across dead levels." When the grain is ripe, a harvesting machine is, by the same means, pulled across the field. "Its cutters are often twenty to twenty-six feet wide . . . . When the cutters have performed their work, automatic rakers gather in the grain stalks and carry them to rows of knives where they are at once headed. Then, in the same operation, the wheat is threshed out, cleaned and sacked, and behind the great combination harvester there is left a trail of sacked wheat ready for the market. Another traction engine with a train of a dozen cars follows in the wake of the thresher and harvester, gathering up the wheat and carting it to the granary. In this manner fully seventy acres and more of wheat land are harvested in one day."<sup>1</sup> With the aid of these engines the work of "plowing, cultivating, seeding, and harvesting on farms of a thousand acres in extent" may be done by half a dozen men in "much less time than a whole army of employees could do the work on a farm of half the acreage."<sup>2</sup> For the profitable use of such vast machine power, large fields are a self-evident necessity.

<sup>1</sup> George E. Walsh, "Steam Power for Agricultural Purposes," in *Harper's Weekly*, Vol. XLV, p. 567.

<sup>2</sup> *Cassier's Magazine*, Vol. XIX, p. 139, and *Harper's Weekly*, Vol. XLV, p. 567.



The farm machines in use in the Central States are less massive and of a more varied nature and yet, in the rate of progress which they show, are no less wonderful than those above described. Instead of a hoe for covering seed-corn, dropped by hand, the farmer now uses a check-row planter drawn by horses and depositing the seed at regular intervals so that the rows may be cultivated with equal facility either in the direction of the planting or across. As a means of cultivating the corn, hoes are now laid aside, and in their stead the farmer quite commonly uses a riding plow. Steam power corn-huskers and corn-shellors are found. Instead of the old hand-method of shelling corn by scraping the ears against the handle of a frying pan or the blade of a shovel, by which means hardly six bushels could be shelled in a day, the farmer may now have his corn shelled at the rate of a bushel a minute and the machine which does the work will also "carry off the cobs to a pile or into a wagon, and deliver the corn into sacks."

Mowing machines, horse hay-rakes, tedders, and stackers have revolutionized the work of making hay. It formerly required eleven hours of man-labor to cut and cure a ton of hay. Now the same work may be done in one hour and 39 minutes; while the cost for the required man-labor has been decreased from  $83\frac{1}{3}$  to  $16\frac{1}{4}$  cents per ton.<sup>2</sup> Potato planters and diggers, feed choppers and grinders, manure spreaders, and ditch-digging machines are only a few of many labor-saving devices now common on the farms in the Central States. There is hardly a phase of farm work that has not been essentially changed by the introduction of some new implement or machine.

<sup>1</sup> Department of Agriculture, Year Book (1899), pp. 316-318 and 332.

<sup>2</sup> Department of Agriculture, Year Book (1899), p. 332.

Some idea of the great development which has taken place along these lines may be gained from a consideration of the value of the output of agricultural implements and machinery as reported to the Census Office. For purposes of comparative study, the figures must be taken subject to heavy allowances, because as pointed out by Mr. George K. Holmes,<sup>1</sup> the prices of farm machinery have "declined to an enormous extent," and this too, in spite of the fact that the later machines are more efficient, more durable, more readily operated, lighter, and stronger.

The total value of agricultural implements and machines manufactured during the several census years, as reported to the Census Office, is as follows:<sup>2</sup>

<i>Year.</i>	<i>Total for United States.</i>
1900 . . . . .	\$101,207,428
1890 . . . . .	81,271,651
1880 . . . . .	68,640,486
1870 . . . . .	42,653,500 <sup>3</sup>
1860 . . . . .	20,831,904
1850 . . . . .	6,842,611

<sup>1</sup>Twelfth Census, Manufacturing, IV, p. 353.

<sup>2</sup>Twelfth Census, Manufactures, Vol. IV, p. 344.

<sup>3</sup>The amount as given in the Census Report has been reduced to a gold basis.—See Tenth Census, Manufactures, p. 1.

## PART II

### MACHINERY AND PRODUCTION

#### THE COURSE OF AGRICULTURAL PRODUCTION CONTRASTED WITH THE INCREASE IN THE POPULATION 1840-1900

The first federal census which took account of agricultural products was that of 1840. The principal crops, for the period from 1840 to 1900 as reported to the census office, were as follows :<sup>1</sup>

<i>Year.</i>	<i>Barley bu.</i>	<i>Corn bu.</i>	<i>Cotton bales.</i>	<i>Hay tons.</i>
1899 . . . .	119,634,877	2,666,440,279	9,534,707	84,011,299
1889 . . . .	78,332,976	2,122,327,547	7,472,511	66,831,480
1879 . . . .	43,997,495	1,754,591,676	5,755,359	35,150,710
1869 . . . .	29,761,305	760,944,549	3,011,996	27,316,048
1859 . . . .	15,825,898	838,792,742	5,387,052	19,083,896
1849 . . . .	5,167,015	592,071,104	2,469,053	13,838,642
1839 . . . .	4,161,504	377,531,875	1,580,958	10,248,108

<i>Year.</i>	<i>Oats bu.</i>	<i>Potatoes<sup>2</sup> bu.</i>	<i>Rye bu.</i>	<i>Wheat bu.</i>
1899 . . . .	943,389,375	315,854,903	25,568,625	658,534,252
1889 . . . .	809,250,666	261,496,623	28,421,398	468,373,968
1879 . . . .	407,858,999	202,837,232	19,831,595	459,483,137
1869 . . . .	282,107,157	165,047,297	16,918,795	287,745,626
1859 . . . .	172,643,185	153,243,893	21,101,380	173,104,924
1849 . . . .	146,584,179	104,066,044	14,188,813	100,485,944
1839 . . . .	123,071,341	108,298,060	18,645,567	84,823,272

An examination of these figures shows that the barley crop of 1899 was 28.7 times greater than the barley crop

<sup>1</sup> The figures for the year 1839 are taken from the report of the Sixth Census, p. 408; those for the years 1849, 1859, 1869, 1879, and 1889 from the Eleventh Census, Agriculture, pp. 87-91; those for the year 1899 from the Twelfth Census, Agriculture, Vol. I, p. cxxi. The report of cotton production for the year 1839 was reported in pounds. The figures for that year have been converted to bales on the basis of five hundred pounds per bale.

<sup>2</sup> Includes both Irish and sweet potatoes.

of 1839; the corn, cotton, oats, wheat, and hay crops of 1899 were from 6 to 8 times greater than they were in 1839. The population of the United States in 1900 was, however, only 4.4 times greater than in 1840.

The total production of the eight principal cereals (corn, wheat, oats, barley, rye, buckwheat, rice, and Kaffir corn), expressed in bushels, and the population, as reported by the census authorities, for the period from 1840 to 1900, has been as follows:

<i>Year.</i>	<i>Population.</i>	<i>Cereals, bu.</i>
1900 . . . . .	75,568,686	4,434,698,746
1890 . . . . .	62,622,250	3,520,960,086
1880 . . . . .	50,155,783	2,699,415,752
1870 . . . . .	38,558,371	1,388,526,403
1860 . . . . .	31,443,321	1,242,159,398
1850 . . . . .	23,191,876	871,042,524
1840 . . . . .	17,069,453	617,321,778

If we represent the population in 1840 and the cereal production reported in that year, each by 100 and the population and cereal production reported in succeeding census years by their per cents, respectively, of the population and cereal production reported in 1840, we shall get a new table showing the relative increase in population and cereal production for the period in question. Such a table is presented herewith as follows:

<i>Year.</i>	<i>Population.</i>	<i>Cereals.</i>	<i>Increase in cereals over increase in population.</i>
1900 . . . . .	442.7	718.4	275.7
1890 . . . . .	366.9	570.4	203.5
1880 . . . . .	293.8	437.3	143.5
1870 . . . . .	225.9	224.9 [246.2]	[20.3] <sup>4</sup>
1860 . . . . .	184.2	201.2	17.0
1850 . . . . .	135.9	141.1	5.2
1840 . . . . .	100.0	100.0	. . .

<sup>1</sup>Twelfth Census, Population, I, p. xix.

<sup>2</sup>Twelfth Census, Agriculture, II, pp. 64-65.

<sup>3</sup>Sixth Census, p. 408.

<sup>4</sup>See p. 15.

From these figures it appears that in 1870 the proportion of cereal product to population was slightly below the proportion existing in 1840, but that otherwise there has been an increasingly greater proportion of product to population through the whole of the period from 1840 to 1900.<sup>1</sup>

The comparatively light cereal crop reported in 1870 was doubtless largely due to the unusually poor corn crop of that census year<sup>2</sup> and to the disordered conditions

<sup>1</sup> The following table, except the item of "all cereals," is compiled from bulletin No. 24, of the Division of Statistics, U. S. Department of Agriculture, on "Relations of Population and Food Products in the United States," and shows the per capita production of certain food products, as reported to the Census Office during the period from 1850 to 1900:

	1900	1890	1880	1870	1860	1850
Barley, bu. . . . .	1.57	1.25	.88	.77	.50	.22
Buckwheat, bu. . . . .	.15	.19	.24	.25	.56	.39
Corn, bu. . . . .	34.94	33.89	34.98	19.73	26.68	25.53
Oats, bu. . . . .	12.40	12.92	8.13	7.32	5.49	6.32
Rye, bu. . . . .	.34	.45	.39	.44	.67	.61
Wheat, bu. . . . .	8.66	7.48	9.16	7.46	5.51	4.33
Rice, lbs. . . . .	3.29	2.05	2.19	1.91	5.95	9.28
Potatoes, bu. . . . .	3.60	3.47	3.38	3.72	3.53	2.84
Sweet potatoes, bu. . . . .	.56	.70	.67	.56	1.34	1.65
Sugar, lbs. . . . .	6.54	5.34	5.09	3.45	10.09	14.29
Syrup and molasses, gal. . . . .	.58	.83	.93	.61	.74	.55
Pulse, bu. . . . .	.19	.15	.19	.15	.47	.40
Cattle, no. . . . .	.69 <sup>3</sup>	.82	.72	.62	.81	.77
Swine, no. . . . .	.83	.92	.95	.65	1.07	1.31
Sheep, no. . . . .	.52	.57	.70	.74	.71	.94
All cereals, bu. . . . .	58.7	56.2	53.8	36.0	39.5	37.5

<sup>2</sup> Average yield per acre of cereal crops as estimated by the Department of Agriculture for the census years 1870, 1880, 1890 and 1900. (Bushels.)

Year.	Corn.	Wheat.	Oats.	Barley.	Rye.	Buckwheat.
1899 . . . . .	25.3	12.3	30.2	25.5	14.4	16.6
1889 . . . . .	27.0	12.9	27.4	24.3	13.1	14.5
1879 . . . . .	29.2	13.8	28.7	24.0	14.5	20.5
1869 . . . . .	23.6	13.6	30.5	27.9	13.6	16.9

Department of Agriculture, Year Book (1899), pp. 759-763.

<sup>3</sup> Cattle over one year.

then existing in the Southern States. Some allowance should, doubtless, be made also, in the table as a whole, for changes in the proportion of the several cereal products to the total cereal product.

In the matter of the corn crop reported upon by the census of 1870, it is interesting to note how differently the figures would appear had the yield for that year been a normal one. The average yield of corn, for that year, as estimated by the Department of Agriculture, was 23.6 bushels; but the average for the previous year was 26.0 bushels and that for the succeeding year was 28.3 bushels.<sup>1</sup> The medium between the averages for the next preceding and next succeeding years is 27.1 bushels. With an average yield per acre of corn equal to this medium number the cereal product for the census year 1870 would have been increased by 131,177,939 bushels and the index number representing the cereal production of that year, instead of being 224.9 would have been 246.2. If this latter number be substituted in the column of index numbers for cereal production, there will appear an unbroken increase in the proportion of cereal products to population, during the whole of the period under consideration.<sup>2</sup>

CONCERNING THE INCREASE IN CULTIVATED AREA PER  
FARM WORKER AND THE GREATER EFFECTIVENESS  
OF FARM WORKERS WHEN AIDED BY THE USE OF  
MACHINERY, AS SHOWN BY REPORTS OF THE CENSUS  
OFFICE

The census office statistician for agriculture presents a table as follows :<sup>3</sup>

<sup>1</sup> Department of Agriculture, Year Book (1899), p. 759.

<sup>2</sup> See the right hand column of figures in the table of index numbers, p. 13.

<sup>3</sup> Twelfth Census, Agriculture, I, p. xxxi.

Items.	1900.	1890.	1880.
Number of males in agriculture .	8,771,181	7,787,539	7,075,983
Number of horses, mules and asses . . . . .	20,099,826	17,264,999	12,170,296
Acres of land in specified crops .	272,304,111	214,523,412	164,830,442
Average number of acres to one male worker . . . . .	31.0	27.5	23.3
Average number of acres to one horse . . . . .	13.5	12.4	13.5
Average number of horses to one male worker . . . . .	2.3	2.2	1.7

Farther on, speaking with reference to this table, he says: "The number of acres of leading crops per male worker steadily increased, while the number per working animal was substantially the same in 1900 as in 1880. The increase in the productiveness of man's labor, therefore, is secured by the increased utilization of the power of the horse and mule in driving farm machinery. The figures of the table indicate two important changes in the twenty years. One of these appears in the increase in the number of horses to each male worker from 1.7 to 2.3, a gain of about 35 per cent; the other is the increase in the number of acres cultivated to each male worker from 23.3 to 31.0, or about 34 per cent. From these figures it appears that in the last twenty years, by the aid of machinery, and the substitution of horse power for hand labor, the effectiveness of human labor on farms has been increased to the extent of about 33 per cent."

The statement that there has been an 'increase in the number of horses and of acres cultivated, to each male worker' is mathematically correct enough but it gives the impression that the *farmers have both increased in numbers at the same rate as people engaged in other occupations and have expanded their holdings*, which is not at all true. It will be noted that the num-

ber of horses per acre of cultivated land was the same in 1900 as in 1880. Horses and crop acreage have, therefore, increased at an equal rate. Either these have increased at an extraordinary rate or the third term (male workers), has increased at less than the normal rate. It will be shown farther on (pp. 36-38) that this latter hypothesis is the true one. The increased crop acreage per worker is, therefore, to be looked upon not so much as an expansion of farm holdings as a contraction in the number of workers.

The average number of acres<sup>1</sup> in all farm crops per farm worker<sup>2</sup> (agricultural laborers, farmers, planters, and overseers)—male and female—as returned by the Censuses of 1880, 1890, and 1900 was as follows:

	1900.	1890.	1880.
United States <sup>3</sup> . . . . .	27.0	25.9	21.8
North Atlantic division . . . .	21.3	21.2	21.7
South Atlantic division . . . .	13.3	14.2	13.8
North Central division . . . .	45.2	40.4	31.9
South Central division . . . .	16.5	15.9	14.2
Western division . . . . .	39.6	33.7	34.2

Presented from the basis of a common denominator, the data shown in the foregoing table appear as follows:

	Base.	1880.	1890.	1900.
United States . . . . .	21.8 =	100	118.7	123.8
North Atlantic division . . . .	21.7 =	100	97.7	98.0
South Atlantic division . . . .	13.8 =	100	102.9	98.6
North Central division . . . .	31.9 =	100	126.6	141.7
South Central division . . . .	14.2 =	100	111.9	116.7
Western division . . . . .	34.2 =	100	98.5	115.8

Such calculations are good as indicating the greater crop area which the average person finds it profitable to

<sup>1</sup> For data of acreage see p. 102.

<sup>2</sup> For total number of workers see p. 99.

<sup>3</sup> In the various tables presented in this essay the term "United States" is used to signify only the five principal geographical divisions taken collectively. Data from the Census Reports have been modified, when necessary, to make them conform to such restricted meaning.



tend when aided by machine power. One needs to be on guard, however, against taking them as indexes of the greater effectiveness of man-labor, due to the use of machinery; for obviously, they take no account of the character of the cultivation—whether intensive or extensive. Construed as indexes of effectiveness, these figures show that the effectiveness of the average worker in the North Central, South Central, and Western Divisions has been much increased during the period from 1880 to 1900 while that of the average worker in the North Atlantic and South Atlantic divisions has actually become less. Such a conclusion would be clearly wrong. There is good reason for believing that the effectiveness of the average farm worker in each of these divisions,<sup>1</sup> and even in the New England States alone<sup>2</sup> was, in all likelihood, very much greater in 1900 than in 1880.

If we take the value of product per person engaged in agriculture as an index of effectiveness under the methods in use in 1880 and in 1900 we shall find that the effectiveness of the average worker in the United States was greater, by nearly 60 per cent.,<sup>3</sup> in 1900 than in 1880.

The census of 1870 did not report crop acreage at all, and the value of agricultural products was reported in connection with the value of betterments, so that no showing of the relative effectiveness of agricultural workers, in 1870 and in 1900, based either on crop acreage or on value of products, can be made; but, judged by the quantity of cereal product reported, per

<sup>1</sup> See p. 69-70.

<sup>2</sup> See p. 31.

<sup>3</sup> 58.4 per cent. For value of product per person engaged in agriculture in 1880 and 1900 see table at p. 70.

person engaged in farm work (*i. e.*, farmers, planters, overseers, and agricultural laborers), the effectiveness of the average farm worker in 1900 was greater than in 1870 by nearly 86 per cent.<sup>1</sup> The data at hand do not appear to admit of any similar showing as between the year 1900 and any date prior to 1870.

THE GREATER EFFECTIVENESS OF FARM WORKERS WHEN  
AIDED BY THE USE OF MACHINERY, AS SHOWN BY  
INVESTIGATIONS OF THE DEPARTMENT OF LABOR

The Thirteenth Annual Report of the Department of Labor gives the results of an extended investigation concerning production by hand and by machine methods, and affords the means for a reliable estimate of the influence of machine power. That portion devoted to agricultural operations shows in detail, for example, how many persons were ordinarily required for the production, by hand or by machine methods, of a given quantity of barley; what separate operations were necessary in that production, as plowing, sowing, harrowing, etc.; what time was required for each operation, what tools or machines, if any, or other helps were used, and the money cost of each operation.

From the summary given on pages 24-25 of that report it appears that the man-labor power requisite for the production of thirty bushels of barley by the methods commonly in use in the season of 1829-30, amounted to 63 hours and 35 minutes. The man-labor power required for accomplishing the same result, by the methods commonly in use in the season of 1895-96, is shown to have been only 2 hours and 42.8 minutes. From such data, the barley crop of 1896 being known,

<sup>1</sup> 85.8 per cent. The cereal product per worker, as above, in 1870, was 236.5 bushels; in 1900 it was 439.6 bushels.

we may readily determine not only what amount of man-labor was requisite for the production of that crop by the means commonly in use at that time, but also how much barley that same labor-power could have produced by the means commonly in use in the season of 1829-30. The difference between the quantity actually produced in the season of 1895-96, and the quantity which the labor-power required for the work of that season, could have produced by the earlier hand methods, will represent the greater product due to the use of machinery. The crediting of the whole of this difference to the use of machinery is, doubtless, crediting it with too much. Credit is due, also, to better methods of cultivation, to pulverization of soils, to the use of fertilizers, to irrigation, rotation of crops, better seed, etc. These are not machine forces although they are largely dependent upon the use of machinery as the use of machinery is, in some degree, dependent upon them. But to attempt the separation of these credits would be much like attempting to determine which blade of a pair of shears does the cutting. Moreover, these various other forces play, comparatively, a very incidental and subsidiary part. I believe that the following pages will justify this opinion and venture, therefore, to disregard whatever inaccuracy there may be involved in the statement and to say that the entire increased product is due to the use of machinery.<sup>1</sup>

It will be sufficient, for purposes of illustration, to consider only a few of the principal crops in the pro-

<sup>1</sup> For the purpose of this discussion I shall use the term machinery, generally, to signify not only machines, but also tools or implements, and other man-labor saving forces when used as essential adjuncts or parts of machines. For example, horses, when used to draw a reaping machine, will be considered as much a part of the machine as an engine and boiler would be, if used for the same purpose.

duction of which machinery has become a recognized factor. The crops selected for this purpose, together with the time of man-labor requisite for producing stated quantities of each crop by hand and by machine methods, as reported by the Department of Labor, are shown in the following table :—

Unit No. 1	Name and quantity of crop produced and description of work done.	Year of Production		Time Worked			
		Hand	Machine	Hand		Machine	
				hrs.	min.	hrs.	min.
3	Barley : 30 bushels (1 acre) barley . . . .	1829-30	1895-96	63	35.0	2	42.8
9	Corn : 40 bushels (1 acre) yellow corn, husked ; stalks left in field . . . . .	1855	1894	38	45.0	15	7.8
10	Cotton : By hand, 750 pounds ; by machine 1000 pounds (1 acre) seed cotton . . . . .	1841	1895	167	48.0	78	42.0
12	Hay : Harvesting 1 ton (1 acre) timothy hay	1850	1895	21	5.0	3	56.5
13	Oats : 40 bushels (1 acre) oats . . . . .	1830	1893	66	15.0	7	5.8
16	Potatoes : 220 bushels (1 acre) potatoes . .	1866	1895	108	55.0	38	. .
17	Rice : 2640 pounds (1 acre) rough rice . .	1870	1895	62	5.0	17	2.5
18	Rye : 25 bushels (1 acre) rye . . . . .	1847-48	1894-95	62	58.9	25	10.0
26	Wheat : 20 bushels (1 acre) wheat . . . .	1829-30	1895-96	61	5.0	3	19.2

These several crops for the years covered by the data concerning production by the aid of machine power, were as follows :<sup>2</sup>

<sup>1</sup>The "unit numbers" here given are the unit numbers made use of in the Thirteenth Annual Report of the Department of Labor, from which the data in the table are taken. The numbers are repeated here only for purposes of reference.

<sup>2</sup>Department of Agriculture, Year Book for 1900.

Barley, crop of	1896	(bushels)	69,695,223
Corn, " "	1894	(bushels)	1,212,770,052
Cotton, " "	1895	(500 lb. bales)	7,161,094
Hay, " "	1895	(tons)	47,078,541
Oats, " "	1893	(bushels)	638,854,850
Potatoes, " "	1895	(bushels)	297,237,370
Rice, " "	1896	(pounds)	168,685,440
Rye, " "	1895	(bushels)	27,210,070
Wheat " "	1896	(bushels)	427,684,346

The number of days-work of man-labor requisite for producing the foregoing specified crops by the aid of machine power, together with the quantity of those several crops which the same labor-power could have produced by the earlier hand method, are shown in the following :

Name	Crop of	Days-work of man-labor re- quired	The same labor power	
			by meth- ods of	could have produced
Barley .	1896	630,354	1829-30	(bushels) 2,972,839
Corn . .	1894	45,873,027	1855	(bushels) 473,528,022
Cotton .	1895	28,178,904	1841	(bales) 2,518,972
Hay . .	1895	18,556,791	1850	(tons) 8,801,640
Oats . .	1893	11,334,266	1830	(bushels) 68,433,307
Potatoes	1895	5,134,100	1866	(bushels) 103,703,321
Rice . .	1895	108,889	1870	(pounds) 46,303,587
Rye . .	1895	2,739,147	1847-48	(bushels) 10,872,795
Wheat .	1896	7,099,560	1829-30	(bushels) 23,245,490

Finding next the difference between the quantities of the several crops actually produced under machine methods, in the years indicated, and the quantities which the labor-power requisite for their production with the aid of machines could have produced had it been devoted to the production of those same crops by hand methods, we have the following :

<i>Crop of</i>	<i>Due to use of machinery.</i>	<i>% of actual product.</i>
Barley . . . 1896 . . (bushels) . . . . .	66,722,384 . = .	95.7
Corn . . . . 1894 . . (bushels) . . . . .	739,242,030 . = .	60.9
Cotton . . . 1895 . . (bales) . . . . .	4,642,122 . = .	64.8
Hay . . . . 1895 . . (tons) . . . . .	38,276,901 . = .	81.3
Oats . . . . 1893 . . (bushels) . . . . .	570,421,543 . = .	89.2
Potatoes . . 1895 . . (bushels) . . . . .	193,534,049 . = .	65.1
Rice . . . . 1895 . . (pounds) . . . . .	122,381,853 . = .	72.5
Rye . . . . 1895 . . (bushels) . . . . .	16,337,275 . = .	60.0
Wheat . . . 1896 . . (bushels) . . . . .	404,438,856 . = .	94.5

The increased effectiveness of man labor power when aided by the use of machinery, as indicated by these figures, varies from 150 per cent in the case of rye to 2244 per cent in the case of barley. From this point of view a machine is "not a labor-saving" but rather a "product-making" device.<sup>1</sup> Taking the per cent of labor saved (See page 29), as indicating the average proportion of these crops due to the use of machinery, it appears that the quantity of product is almost five times as great, per unit of labor, as it formerly was.

#### THE COST OF PRODUCTION

Touching the difference in the cost of production per unit of product the Thirteenth Annual Report of the Department of Labor furnishes some data that will well repay a somewhat extended consideration. It should be observed, however, that these data with reference to the cost of production, although collected at the same time and, doubtless, with the same care, as the data already taken from that report, are, nevertheless, for the purposes of generalization, far less reliable. The average workman will perform the same quantity of work in a day, whether he works in one locality or in another; but rates of wages vary with localities and may vary both absolutely and relatively with differences in time. With this qualification in mind, it will be safe to take up the consideration of the data.

<sup>1</sup> Hadley; *Economics*, page 338.

Including the crops above considered, the report of the Department of Labor, gives detailed information concerning the cost of production, by hand and by machine methods, of twenty-one different crops. The table on the next page gives the results of the several investigations in this particular, arranged in the order of the greatest saving in cost of production by machine as compared with hand methods.<sup>1</sup>

The per cent column of the following table shows that, for the most part, there has been a very great decrease in the cost of producing these various crops. The median is 39.92 per cent, but this number is clearly too low, for the crops in which machinery is most used are principally in the upper part of the table.

<sup>1</sup> In the production of peas and in both tobacco crops there has been an increase in the cost. This increase is not, however, from the use of machinery in the production of these crops, but rather from the lack of it. In the case of tobacco (unit 22), for example, in which there has been the greatest increase in cost, the hand method production was with the aid of the following: wagon, spades, hoes, rakes, wooden moldboard plows, harrow, turn plow, wooden pegs for setting plants, plow for cultivating, and tobacco knives. The total extent of the machinery used in the production of this crop by machine methods was as follows: plow, harrow, rakes, hoes, disk harrow, drag, wagon and barrels, transplanter, double-shovel plow, tobacco knives, wagon and racks, and screw racket prize. (Thirteenth Annual Report, Department of Labor, page 464.)—It must be evident at once from a comparison of these items that the difference in machinery cannot account for the difference in cost of production. The cause of the increased cost in the production of tobacco and peas (units 15, 22, and 23) was a higher rate of wages. In the case of peas, wages rose from 62½ cents to \$1.00 per day. In the case of tobacco (unit 22), wages rose from 30 cents per day to \$20 and \$23 per month; in unit 23, the rise of wages was from 75 cents to \$1.00 per day. It will be readily understood that when there is little or no change in the methods of production a rise in the rate of wages must cause a rise in the total cost of production.

The "hand method" of production, as explained in the report of the department, "should not be construed to mean a method whereby a product is made entirely by the unaided hand and absolutely without the use of machines, but rather as the primitive method of production which was in vogue before the general use of automatic or power machines"—(Thirteenth Annual Report, Department of Labor, p. 11.)—Similarly, it should be observed, in this connection, that "machine method" does not necessarily imply that machines are used, but only that the work was done by the most approved methods practiced in more recent years.

For a table of wages under hand and machine methods, see p. 60.

**COST OF PRODUCTION BY HAND AND BY MACHINE METHODS.**

Unit No.	Name and Quantity of Crop Produced.	Year of Product'n		Cost.		Per cent Decrease
		Hand Method.	Machine Method.	Hand Method.	Machine Method.	
3	Barley: 30 bu. (1 acre)---	1829-30	1895-96	\$ 3.88	\$ 1.06	72.62
27	Wheat: 20 bu. (1 acre)---	1829-30	1895-96	4.00	1.12	71.98
5	Broom corn: 1 ton (3 acres)	1860	1895	90.33	25.37	71.92
17	Rice: 2640 lbs. (1 acre)	1870	1895	7.20	2.08	71.09
21	Sweet Potatoes: 105 bushels (1 acre)	1868	1895	34.30	10.29	70.00
12	Hay: Harvesting 1 ton (1 acre) timothy hay	1850	1895	1.92	.63	66.95
8	Corn: 40 bushels (1 acre) yellow corn, shelled; stalks, husks and blades cut into fodder-----	1855	1894	16.34	6.62	59.49
20	Sugar corn: 20 tons (1 acre)	1855	1895	40.32	16.37	59.40
13	Oats: 40 bushels (1 acre)	1830	1893	3.85	1.60	58.47
19	Strawberries: 4,000 qts. (1 acre)	1871-72	1894-95	231.28	97.92	57.66
24	Tomatoes: 150 bu. (1 acre)	1870	1895	36.62	15.88	56.64
16	Potatoes: 220 bu. (1 acre)	1866	1895	13.18	5.97	54.68
26	Wheat: 20 bu. (1 acre)---	1829-30	1895-96	3.83	2.03	47.11
11	Hay: Harvesting and baling 1 ton (1 acre) timothy hay-----	1860	1894	3.19	1.91	39.92
2	Apple trees: 10,000 (1 acre) 32 months, from grafts-----	1870-72	1893-95	200.00	121.00	39.50
4	Beets: 300 bushel (1 acre)	1850	1895	32.30	20.01	38.05
9	Corn: 40 bushels (1 acre) yellow corn, husked; stalks left in field-----	1855	1894	5.03	3.31	34.20
7	Carrots: 30 tons (1 acre)	1850	1895	38.71	37.21	29.72
14	Onions: 250 bu. (1 acre)	1850	1895	32.56	23.89	26.64
1	Apple trees: 10,000 (1 acre) 32 months, from grafts-----	1869-71	1893-95	202.00	150.69	25.41
10	Cotton <sup>1</sup> : By hand 750 lbs.; by machine 1000 lbs. (1 acre)-----	1841	1895	6.15	4.71	23.42
18	Rye: 25 bushels (1 acre)	1847-48	1894-95	5.25	4.30	18.10
25	Turnips: 350 bu. (1 acre)	1855	1895	25.63	23.36	8.88
6	Carrots: 30 tons (1 acre)	1855	1895	30.61	29.96	2.13
						Percent. Increase
15	Peas: 20 bushels (1 acre) field Peas-----	1856	1895	6.66	6.76	1.56
23	Tobacco: 1,500 lbs. (1 acre) Spanish seed leaf	1853	1895	25.85	27.99	8.28
22	Tobacco: <sup>2</sup> By hand, 1,200 lbs.; by machine 1,250 lbs. (1 acre)-----	1844	1895	.74	2.67	261.42

<sup>1</sup> See footnote "1" page 21.

<sup>2</sup> The data have been modified to show a comparison on the basis of equal quantities produced. If the equal areas be taken instead, the line should read: Cotton: By hand, etc., \$9.23; \$9.42. 2.09.

<sup>3</sup> The data have been modified to show a comparison on the basis of equal quantities produced. If the equal areas be taken instead, the line should read: Tobacco: By hand, etc., \$8.88; \$33.39; 276.33.



The data requisite for a similar showing with respect to all farm crops and for any certain period are, I think, not to be had; but we can apply the data presented in the foregoing table to the principal crops of the year 1899, as reported by the Twelfth Census.<sup>1</sup> The results are as follows:—

THE COST OF PRODUCING CERTAIN CROPS OF THE YEAR 1899, BY  
HAND AND BY MACHINE METHODS.

Name <sup>2</sup>	Quantity produced	Cost of Production	
		Hand Method	Machine Meth.
Barley (3) . . . . . (bu.)	119,634,877	\$ 15,472,777	\$ 4,227,098
Broomcorn (5) . . . (lbs.)	90,947,370	4,107,576	1,153,650
Corn (9) . . . . . (bu.)	2,666,440,279	335,304,865	220,647,933
Cotton (10) . . . . . (bales)	9,534,707	58,638,448	44,898,469
Hay (12) . . . . . (tons)	84,011,299	161,301,694	52,927,118
Oats (13) . . . . . (bu.)	943,389,375	90,801,227	37,735,575
Onions (14) . . . . . (bu.)	11,791,121	1,535,675	1,126,759
Peas (15) . . . . . (bu.)	9,440,269	3,143,609	3,190,810
Potatoes (16) . . . . (bu.)	273,328,207	16,373,935	7,417,133
Rice (17) . . . . . (lbs.)	283,722,627	773,788	223,539
Rye (18) . . . . . (bu.)	25,568,625	5,369,411	4,397,803
Sugar cane (20) . . . (tons)	6,441,578	12,986,221	5,272,431
Sweet potatoes (21) (bu.)	42,526,696	41,676,162	4,167,616
Tobacco (22) . . . . (lbs.)	868,163,275	6,424,408	18,491,859
Wheat (26) . . . . . (bu.)	658,534,252	126,109,309	66,841,226
Total . . . . .		\$880,019,105	\$472,719,019

The estimated cost of producing these crops by machine method is only 53.7 per cent of the estimated cost of producing the same crops by hand method. In other words, the saving in cost of production amounts to 46.3 per cent. The average date of the hand method investigations made use of in this presentation is 1850; the average date for the machine method investigations

<sup>1</sup> Twelfth Census: Agriculture I, p. cxxi.

<sup>2</sup> The figures in parentheses are the unit numbers used by the Department of Labor and indicate what set of reports was used as the basis of the estimated cost of production as here presented. The dates of the investigations for hand and for machine methods may be found by reference to the preceding table.

is 1895—a difference of forty-five years. Surely it will not be too much to say that during the last half of the nineteenth century the cost of production of these crops was reduced by one-half. If we take into account the decreased cost to the farmer of food and lodging for his hired workmen and of the decreased cost of storage room for grain in the straw, then the total saving must appear to be even greater than this.<sup>1</sup>

#### FLUCTUATIONS IN QUANTITY OF PRODUCT

The use of machinery in the production of agricultural products, as in the production of manufactures, tends to diminish the fluctuations in supply. Capital in any form, cannot, ordinarily, be diverted from the production for which it was designed, without more or less waste. If, for example, a farmer wishes to change from producing wheat to producing potatoes, he must sell his reaper at a sacrifice. The difficulty in making such changes operates against great and sudden changes from

<sup>1</sup> "To ascertain the amount of saving precisely is difficult; but looking through the successive stages of management and seeing that the owner of a stock farm in the preparation of his land by using lighter ploughs is able to cast off one horse in three; and by adopting other simple tools to dispense altogether with the great part of his ploughing; that in the culture of crops by the various drills, horsepower can be partly reduced; the seed otherwise wanted, partly saved; and the use of manures greatly economized; while the horse hoe replaces the hoe at one half the expense; that at harvest the American reaper can effect nearly thirty men's work; while the Scotch cart replaces the old English wagon with exactly half the horses; that in preparing corn for food the steam threshing machine saves two thirds of our former expense; and in preparing food for stock the turnip-cutter, at an outlay of 1s., adds 8s. a head in one winter to the value of sheep; lastly, that in the indispensable but costly operation of drainage, the materials have been reduced from 80s. to 15s., to one fifth namely of their former cost; it seems to be proved that the efforts of agricultural mechanists have been so far successful, as in all these main branches of farming labour taken together, to effect a saving on outgoings or else an increase of incomings of not less than one-half."—Quoted from Pusey's report on Agricultural Implements in the Exhibit of 1851, by Hearn, "*Plutology*," page 171.

one line of production to another, even when the prospects for profit in such other line may be unusually bright. Thus the supply of the more profitable product is restricted. On the other hand, farmers having their capital in the form of machinery devoted to the production of some particular crop, will continue to produce somewhat of that crop rather than to have their capital lie idle or to suffer a greater loss from an attempt to change. This influence operates towards maintaining the former supply.

As a consequence of these two dissimilar forces, the supply of any product is more constant, and the resulting fluctuations in price less violent than they otherwise would be.

#### THE QUALITY OF AGRICULTURAL PRODUCTS

The use of machinery is not without some influence on the quality of the product. Corn, which, by reason of too early or too late planting, as was necessarily frequent under hand methods of production, does not mature properly, and is unwholesome; and grain cut, as formerly, under hand methods, before it is thoroughly ripened, becomes shrunken and of less value.

In the matter of preparing grain for use the advantages of machinery are equally evident. The present generation of Americans would be slow to eat bread made of flour from wheat threshed by the treading of horses or cattle.

# PART III

## MACHINERY AND LABOR

### SAVING OF LABOR

The quantity of labor which, by the use of machine power, is saved for other uses, may be determined, in the case of any particular crop, by finding the difference between the number of days-work requisite for producing it by hand and by machine methods. In the following table there is shown the quantity of man-labor requisite for producing the nine principal farm crops by hand and by machine methods; the quantity of labor saved in each case by the use of machinery; and the per cent which the quantity of saved labor is of the quantity requisite for producing the several crops by hand method.

#### DAYS-WORK NECESSARY TO PRODUCE

##### BY HAND METHODS

	<i>Crop of</i>	<i>Methods of</i>	<i>Days-work</i>
Barley . . . . .	1896 . . . .	1829-30 . . . .	14,771,515
Corn . . . . .	1894 . . . .	1855 . . . .	117,487,098
Cotton . . . . .	1895 . . . .	1841 . . . .	80,108,771
Hay . . . . .	1895 . . . .	1850 . . . .	99,257,257
Oats . . . . .	1893 . . . .	1830 . . . .	105,810,334
Potato . . . . .	1895 . . . .	1866 . . . .	14,715,501
Rice . . . . .	1896 . . . .	1870 . . . .	396,687
Rye . . . . .	1895 . . . .	1847-48 . . . .	6,854,942
Wheat . . . . .	1896 . . . .	1829-30 . . . .	130,621,927

Total . . . . . 570,024,032

##### BY MACHINE METHODS

<i>Crop of</i>	<i>Methods of</i>	<i>Days-work</i>	<i>Days-work saved by machinery</i>	<i>Per cent</i>
Barley . . . . .	1896 . . . . 1895-96 . . . .	630,354 . . . .	14,141,161 . . . .	= 95.7
Corn . . . . .	1894 . . . . 1894 . . . .	45,873,027 . . . .	71,614,071 . . . .	= 60.9
Cotton . . . . .	1895 . . . . 1895 . . . .	28,178,904 . . . .	51,929,867 . . . .	= 64.8
Hay . . . . .	1895 . . . . 1895 . . . .	18,556,791 . . . .	80,700,466 . . . .	= 81.3
Oats . . . . .	1893 . . . . 1893 . . . .	11,334,266 . . . .	94,476,068 . . . .	= 89.2
Potato . . . . .	1895 . . . . 1895 . . . .	5,134,100 . . . .	9,581,401 . . . .	= 65.1
Rice . . . . .	1896 . . . . 1896 . . . .	108,889 . . . .	287,796 . . . .	= 72.5
Rye . . . . .	1895 . . . . 1894-95 . . . .	2,739,147 . . . .	4,115,795 . . . .	= 60.0
Wheat . . . . .	1896 . . . . 1895-96 . . . .	7,099,560 . . . .	123,522,367 . . . .	= 94.5
Totals . . . . .		119,655,038	450,368,992	= 79.0

The total amount of man-labor-power saved by the use of machinery in the production of these nine crops was 450,368,992 days-work or 79.0 per cent of the amount of work which would have been required to produce those same crops by the earlier hand methods. In other words, the quantity of labor now requisite for the production of a given quantity of these nine crops is, on the average, only 21 per cent, or a little over one-fifth of the quantity which would be requisite under the former hand methods of production.<sup>1</sup>

#### DISPLACEMENT OF LABOR

The question of the displacement of labor is one of peculiar interest to those who work for hire, because upon it seems to depend the further question of whether the use of machinery decreases the opportunities for earning a livelihood. That the introduction of machinery does frequently deprive workmen of employment in particular lines of work is undeniably true. The introduction of a harvesting machine throws cradlers and binders out of employment just as certainly as the introduction of water drives air out of a jug. It is idle to say that machinery does not displace individual workmen and equally idle to contend that such displacement does not entail hardship and suffering, for the more thoroughly and completely one devotes himself to any particular line of work, the less fitted does he become for taking up, and gaining a livelihood in, some other occupation. The extent of change which the introduction of machinery produces in the occupation of individuals is much obscured by the fact that the machine workman is usually given

<sup>1</sup> See also Edward Atkinson's "Distribution of Products", pages 14-15 and 287.

the same name as was borne by his predecessor ; as, for example, men who operate a steam threshing machine are called threshers, though they may never have seen a flail and are almost as little fitted for operating a flail and winnowing apparatus as the old time threshers would be to operate the new machine. The *old* occupation is gone. What we now have is a *new* occupation passing under the old name. And a new class of workmen (machinists,) are in charge.

It is only when we speak of labor as a quantity or of laborers in mass that we can presume to say there has been no displacement of labor by machinery ; and yet there may be, in this sense also, a displacement of labor. The displacement may be absolute, as where the labor force in any line of work is decreased, or it may be only relative, as where the rate of increase in the number of laborers employed falls below the rate of increase of laborers employed in industries generally.

#### THE ABSOLUTE DISPLACEMENT

For the agricultural industry considered as a whole, New England furnishes an instance of the absolute displacement of labor. In 1880, the population, ten years of age and over, engaged in agriculture, numbered 304,679 ; but in 1900, the number was only 287,829.<sup>1</sup> This decrease was not due to a decadence of agriculture in those states, for the value of the New England agricultural products was more than fifty per cent greater in 1900 than in 1880.<sup>2</sup> It must have been due to the introduction of machinery as indicated

<sup>1</sup> See page 101.

<sup>2</sup> The value of New England agricultural product, as reported in 1880, was \$103,343,566 ; in 1900 it was \$169,523,435. Twelfth Census : Agriculture I, page 703.

by the reported valuation of agricultural implements and machines, which increased from \$1.68 per acre of improved land in 1880, to \$4.49 per acre in 1900.<sup>1</sup>

With respect to the work of cultivating and caring for those nine crops in the production of which machinery appears to be most extensively used, we may determine what absolute displacement, if any, has taken place by finding in each case what amount of labor was necessarily employed in the time of production by hand methods and comparing that amount with the amount of labor necessarily employed in the time of production by machine methods. Data of crop production for the exact years covered by the report of the Department of Labor concerning production by hand method cannot be secured for all of the crops, but taking the best available data and tabulating results we have the following:

DAYS-WORK OF MAN-LABOR REQUIRED FOR PRODUCING THE

	<i>Crop of<sup>2</sup></i>	<i>By methods of</i>	<i>Days-work</i>
Barley . . . . .	1839 . . . .	1829-30 . . . .	882,007
Corn . . . . .	1855 . . . .	1855 . . . .	74,151,217
Cotton . . . . .	1841 . . . .	1841 . . . .	13,717,188
Hay . . . . .	1849 . . . .	1850 . . . .	29,176,470
Oats . . . . .	1839 . . . .	1830 . . . .	20,381,312
Potato . . . . .	1866 . . . .	1866 . . . .	5,307,260
Rice . . . . .	1871 . . . .	1870-71 . . . .	124,383
Rye . . . . .	1849 . . . .	1847-48 . . . .	3,574,396
Wheat . . . . .	1839 . . . .	1829-30 . . . .	25,905,766
Total . . . . .			173,219,999

<sup>1</sup> Twelfth Census : Agriculture I, page 698.

<sup>2</sup> The barley crop of 1839 was 4,161,504 bushels—Sixth Census, page 408.

The corn crop of 1855 is assumed to be 765,431,923 bushels. This is midway between the amounts reported to the census office in 1850 and 1860.

The cotton crop of 1841 was 1,634,945 bales.—World Almanac for 1896, page 164.

The hay crop of 1849 was 13,838,642 tons.—Eleventh Census : Agriculture, page 90.

<i>Crop of</i>	<i>By methods of</i>	<i>Days-work</i>	<i>Difference in days-work</i>	<i>Displace- ment per cent</i>
Barley . . . . 1896 . .	1895-96 . .	630,354 . .	251,653 . .	28.5
Corn . . . . 1894 . .	1894 . .	45,873,027 . .	28,278,190 . .	38.1
Cotton . . . . 1895 . .	1895 . .	28,178,904 . .		
Hay . . . . 1895 . .	1895 . .	18,556,791 . .	10,619,679 . .	36.4
Oats . . . . 1893 . .	1893 . .	11,334,266 . .	9,047,046 . .	44.4
Potato . . . . 1895 . .	1895 . .	5,134,100 . .	76,536 . .	3.3
Rice . . . . 1896 . .	1895-96 . .	108,889 . .	15,494 . .	12.5
Rye . . . . 1895 . .	1894-95 . .	2,739,147 . .	835,249 . .	23.4
Wheat . . . . 1896 . .	1895-96 . .	7,099,560 . .	18,806,206 . .	72.6
Total . . . . .		119,655,038	67,930,053	42.5

The table shows that in the work of producing each of the crops considered, excepting only the cotton crop, there has been an absolute displacement of man labor. Disregarding the cotton crop, the absolute displacement in the work of producing the other eight crops is 42.5 per cent. If cotton be included in the summary and allowance be made for the additional labor employed in the production of that crop, the absolute displacement becomes 30.9 per cent.

The oats crop of 1839 was 123,054,992.—Report of the Department of Agriculture for 1862, page 572.

The potato crop of 1866 was 107,200,976 bushels.—Year Book of Department of Agriculture, 1898, page 679.

The rice crop of 1870-71 was 52,892,400 pounds.—Letter of August 26, 1902 from Department of Agriculture, Division of Statistics.

The rye crop of 1849 was 14,188,813 bushels.—Patent Office Report, 1853, Part 2, page 155.

The wheat crop of 1839 was 84,821,065 bushels.—Report of Department of Agriculture, 1862, page 572.

Crop reports for the desired years could not be found in every case. When the difference between the year reported upon by the investigations of the Department of Labor and the nearest year for which a crop report could be had was greater than one year a later crop report was preferred as yielding a displacement of labor too low rather than too high.



## THE RELATIVE DISPLACEMENT

The relative increase or decrease of the population engaged in agriculture as compared with the increase or decrease of the population engaged in each of the other occupation classes, for the continental portion of the United States, and for the several geographical divisions, during the period from 1880 to 1900, is shown in the following tables:<sup>1</sup>

UNITED STATES				
<i>Males and females ten years of age and over</i>	<i>Base</i>	<i>1880</i>	<i>1890</i>	<i>1900</i>
Total population . . . . .	36,761,607=100	129.0	157.6	
In gainful occupations . . . . .	17,392,099=100	130.7	167.2	
In agriculture . . . . .	7,713,875=100	111.0	135.9	
In professional services . . . . .	603,202=100	156.6	208.7	
In dom. and per. services . . . . .	3,423,815=100	123.3	163.0	
In trade and transp. . . . .	1,866,481=100	178.2	255.4	
In manfg. and mech. arts . . . . .	3,784,726=100	150.0	187.2	
NORTH ATLANTIC DIVISION				
Total population . . . . .	11,270,090=100	123.2	148.1	
In gainful occupations . . . . .	5,309,722=100	131.3	161.6	
In agriculture . . . . .	1,048,442=100	104.9	102.5	
In professional services . . . . .	207,551=100	144.3	198.2	
In dom. and per. services . . . . .	1,211,958=100	121.1	153.2	
In trade and transp. . . . .	828,802=100	158.9	225.4	
In manfg. and mech. arts . . . . .	2,012,969=100	138.1	167.4	
SOUTH ATLANTIC DIVISION				
Total population . . . . .	5,286,645=100	121.4	144.1	
In gainful occupations . . . . .	2,677,762=100	116.4	149.4	
In agriculture . . . . .	1,622,081=100	102.9	125.3	
In professional services . . . . .	62,309=100	148.2	191.6	
In dom. and per. services . . . . .	517,429=100	112.3	154.4	
In trade and transp. . . . .	177,436=100	174.0	238.0	
In manfg. and mech. arts . . . . .	298,507=100	156.4	210.3	
NORTH CENTRAL DIVISION				
Total population . . . . .	12,760,841=100	132.5	158.9	
In gainful occupations . . . . .	5,625,123=100	136.4	170.3	
In agriculture . . . . .	2,735,525=100	113.9	128.3	
In professional services . . . . .	230,622=100	161.0	207.4	
In dom. and per. services . . . . .	1,025,089=100	129.6	171.7	
In trade and transp. . . . .	595,791=100	193.2	280.5	
In manfg. and mech. arts . . . . .	1,038,096=100	164.3	208.4	

<sup>1</sup> For absolute numbers, see page 93.

## SOUTH CENTRAL DIVISION

<i>Males and females ten years of age and over</i>	<i>Base 1880</i>	<i>1890</i>	<i>1900</i>
Total population . . . . .	6,076,243=100 . .	128.4 . .	166.6
In gainful occupations . . . .	3,022,173=100 . .	120.3 . .	172.4
In agriculture . . . . .	2,120,525=100 . .	109.5 . .	155.7
In professional services . . .	73,455=100 . .	155.6 . .	207.4
In dom. and per. services . . .	464,909=100 . .	112.7 . .	170.7
In trade and transp. . . . .	161,449=100 . .	195.3 . .	294.8
In manfg. and mech. arts . . .	201,835=100 . .	178.5 . .	241.3

## WESTERN DIVISION

Total population . . . . .	1,367,788=100 . .	175.5 . .	236.5
In gainful occupations . . . .	757,319=100 . .	176.5 . .	224.9
In agriculture . . . . .	187,302=100 . .	191.5 . .	248.3
In professional services . . . .	29,265=100 . .	228.6 . .	333.1
In dom. and per. services . . .	204,430=100 . .	156.1 . .	181.6
In trade and transp. . . . .	103,003=100 . .	227.3 . .	320.3
In manfg. and mech. arts . . .	233,319=100 . .	153.3 . .	188.4

In the United States as a whole, and in each division, excepting only the Western division, the rate of increase in the agricultural population has been much lower than in any other one of the occupation classes. Not only this, but, subject to the same exception, it has been lower than either the rate of increase in the total population or in the number of those engaged in gainful occupations. We must conclude, therefore, that for the period from 1880 to 1900, as compared with the growth in the number of those engaged in other industries, there has been a decrease in the number of those engaged in agriculture.<sup>1</sup>

<sup>1</sup> Bringing together the data concerning the population engaged in agriculture, as presented in the foregoing tables, so as to show the relative rate of increase in that class in the different sections of the country, we have the following :

## POPULATION ENGAGED IN AGRICULTURE—(MALES AND FEMALES)

	<i>Base 1880</i>	<i>1890</i>	<i>1900</i>
United States . . . . .	7,713,875=100 . .	111.04 . .	135.88
North Atlantic division . . .	1,048,442=100 . .	104.86 . .	102.47
South Atlantic division . . .	1,622,081=100 . .	102.89 . .	125.30
North Central division . . .	2,735,525=100 . .	113.94 . .	128.26
South Central division . . .	2,120,525=100 . .	109.48 . .	155.66
Western division . . . . .	187,302=100 . .	191.51 . .	248.34

The rate of increase of males and females in the various occupation classes has been very different. The relative rates of increase, in the agricultural industry, as reported for the several sections of the country, are shown in the following table:

POPULATION ENGAGED IN AGRICULTURE<sup>1</sup>

	Base	1880	1890	1900
United States, males . . . .	7,119,365=100	. . .	110.78	. . . 132.09
females . . . .	594,510=100	. . .	114.19	. . . 164.39
North Atlantic div., males . . . .	1,043,497=100	. . .	103.38	. . . 99.64
females . . . .	4,945=100	. . .	418.07	. . . 701.37
South Atlantic div., males . . . .	1,358,072=100	. . .	104.68	. . . 125.00
females . . . .	264,009=100	. . .	93.67	. . . 126.86
North Central div., males . . . .	2,720,123=100	. . .	111.64	. . . 125.31
females . . . .	15,402=100	. . .	520.47	. . . 649.38
South Central div., males . . . .	1,811,486=100	. . .	110.28	. . . 155.03
females . . . .	309,039=100	. . .	104.80	. . . 159.30
Western div., males . . . .	186,187=100	. . .	188.98	. . . 241.57
females . . . .	1,115=100	. . .	613.36	. . . 1379.55

The foregoing table shows that women, much more rapidly than men, are turning to agricultural pursuits. The introduction and use of machine power, by decreasing the requirements of physical strength has placed men and women upon a more equal footing and women promise now to invade the agricultural industry as they have heretofore invaded that of manufactures.

We may ascertain the extent of the movement to or from any occupation class during any period by comparing the distribution of the people among the various occupation classes at the beginning of such period with their distribution at its close.

The following table shows, for the United States and for the several geographical divisions, what per cent of the total number of those engaged in gainful occupations in 1870 and in 1900 were in the several occupation classes.<sup>2</sup>

<sup>1</sup> See pp. 94-95.

<sup>2</sup> See p. 96.

		<i>Agri- cul- ture</i>	<i>Prof. ser- vice</i>	<i>Dom. &amp; Pers. service</i>	<i>Trade and Transp.</i>	<i>Mfg. &amp; Mech. Arts</i>
United States . . . . .	1900 . .	35.7 . .	4.3 . .	19.2 . .	16.4 . .	24.4
	1870 . .	47.6 . .	3.0 . .	18.2 . .	9.8 . .	21.4
North Atlantic div. . . . .	1900 . .	12.5 . .	4.8 . .	21.6 . .	21.8 . .	39.3
	1870 . .	24.9 . .	3.4 . .	21.4 . .	14.2 . .	36.1
South Atlantic div. . . . .	1900 . .	50.8 . .	3.0 . .	20.0 . .	10.5 . .	15.7
	1870 . .	63.8 . .	2.0 . .	17.5 . .	5.9 . .	10.8
North Central div. . . . .	1900 . .	36.6 . .	5.0 . .	18.4 . .	17.4 . .	22.6
	1870 . .	52.5 . .	3.4 . .	16.7 . .	9.3 . .	18.1
South Central div. . . . .	1900 . .	63.4 . .	2.9 . .	15.2 . .	9.1 . .	9.4
	1870 . .	71.5 . .	2.2 . .	14.0 . .	5.3 . .	7.0
Western div. . . . .	1900 . .	27.3 . .	5.7 . .	21.8 . .	19.4 . .	25.8
	1870 . .	27.2 . .	3.1 . .	25.4 . .	12.4 . .	31.9

Finding the difference between these several pairs of per cents, and representing increases by positive numbers and decreases by negative numbers, we get the per cent of those engaged in gainful occupations who have shifted to or from the several occupation classes, during the period from 1870 to 1900, as follows:

	<i>Agri- cul- ture</i>	<i>Prof. ser- vices</i>	<i>Dom. &amp; personal services</i>	<i>Trade and Transp.</i>	<i>Mfg. &amp; mech. arts</i>
United States . . . . .	-11.9 <sup>1</sup> . .	1.3 . .	1.0 . .	6.6 . .	3.0
North Atlantic div. . . . .	-12.4 . .	1.4 . .	0.2 . .	7.6 . .	3.2
South Atlantic div. . . . .	-13.0 . .	1.0 . .	2.5 . .	4.6 . .	4.9
North Central div. . . . .	-15.9 . .	1.6 . .	1.7 . .	8.1 . .	4.5
South Central div. . . . .	- 8.1 . .	0.7 . .	1.2 . .	3.8 . .	2.4
Western div. . . . .	0.1 . .	2.6 . .	-3.6 . .	7.0 . .	-6.1

<sup>1</sup>This -11.9 per cent does not mean that there was a decrease, *absolutely*, in the number of those engaged in agriculture, but only *relatively*, and in this sense; that, whereas the number of those engaged in agriculture increased during the period from 1870 to 1900, the increase was so much less than in the other occupation classes that this particular class failed, by a number equal to 11.9 per cent of the total number engaged in gainful occupations in 1900, to maintain its former proportion. A similar remark applies to each one of the other cases where a negative number appears. The decrease in the class of those engaged in manufactures and Mechanic arts, in the Western division is due to the fact that, under the classification used, miners and quarrymen are included in that occupation class. In 1870, these workers constituted a high proportion of the total number engaged in gainful occupations in that division.

Now the total number engaged in gainful occupations in 1900 was 29,074,117,<sup>1</sup> and 11.9 per cent. of 29,074,117 gives 3,459,819 as the number which, under the conditions existing in 1870, should have been found in the agricultural class in 1900 in addition to the number actually found in that occupation class. The number reported as engaged in the agricultural industry, in 1900, was 10,381,765.<sup>2</sup> It appears, therefore, that during the period from 1870 to 1900 the agricultural class lost, relatively, almost one-fourth of its membership. Of this number 1,523,365,<sup>3</sup> nearly one-half of the total for the whole United States, were from the North Central States.

A table constructed similarly to the one given above and showing, separately, the shifting of males and of females among the different occupation classes, during the period from 1870 to 1900, is presented herewith as follows:—<sup>4</sup>

SHIFTING OF THE POPULATION ENGAGED IN THE DIFFERENT  
OCCUPATION CLASSES: 1870-1900.

	<i>Agri- cul- ture</i>	<i>Prof. ser- vices</i>	<i>Dom. &amp; Personal services</i>	<i>Trade Mfg. &amp; Transp. and Mech. Arts</i>
United States, males . . .	-12.5 .	.0.9 .	2.5 .	6.6 . 2.5
females . . .	- 3.2 .	.3.1 .	-13.6 .	8.3 . 5.4
North Atlantic div., males . . .	-14.4 .	.1.2 .	2.3 .	7.5 . 3.4
females . . .	1.5 .	.1.2 .	-15.5 .	10.9 . 1.9
South Atlantic div., males . . .	-13.8 .	.0.6 .	3.6 .	5.3 . 4.3
females . . .	- 7.8 .	.2.6 .	- 4.8 .	2.9 . 7.1
North Central div., males . . .	-15.7 .	.1.0 .	2.9 .	8.0 . 3.8
females . . .	5.4 .	.2.6 .	-30.1 .	12.3 . 9.8
South Central div., males . . .	- 9.0 .	.0.2 .	2.5 .	4.2 . 2.1
females . . .	- 3.4 .	.2.9 .	- 5.7 .	2.4 . 3.8
Western div., males . . .	1.4 .	.1.7 .	- 4.1 .	7.2 . -6.2
females . . .	5.0 .	.6.7 .	-26.0 .	12.1 . 2.2

<sup>1</sup> See p. 42.   <sup>2</sup> See p. 93.

<sup>3</sup> The number engaged in gainful occupations in the North Central States in 1900, was 9,580,913. (Twelfth Census, Population II, page cxxviii). The portion of this population which, during the period from 1870 to 1900, has shifted from agriculture to other occupation classes was 15.9 per cent. (See page 37.)

<sup>4</sup> See pp. 97-98.

It has been shown above that, relatively speaking, nearly three and a half million people changed from agriculture to other industries during the thirty year period, 1870 to 1900. So great a displacement will, doubtless, at first seem incredible. There is need to look at the problem from another point of view: The total number of persons (*i.e.*, farmers, planters, overseers, and agricultural laborers) reported in 1870 as engaged in farming operations was 5,948,561.<sup>1</sup> They produced in that census year 1,388,526,403 bushels of cereals.<sup>2</sup> Making allowance for the short corn crop of 1869,<sup>3</sup> we may say that they were able to have produced 1,519,704,342 bushels of cereals—an average of 255.4 bushels per worker. At this same rate, the 10,381,765 persons (*i. e.*, farmers, planters, overseers and agricultural workers) engaged in cereal production in the census year of 1900<sup>4</sup> could have produced 2,651,502,781 bushels of cereals. The amount would, however, have been less than the actual product in 1899<sup>5</sup> by 1,783,195,965 bushels. To have made good this deficiency, on the basis of the efficiency of the average worker in 1869, would have required an additional force of 6,981,973 workers. This is more than double the number of those who went from agriculture into other occupations. We must, therefore, in all fairness, say, since the machine power introduced into the business of farm work during the period from 1869 to 1899 has more than taken the place of those workers who, during that period, removed from agriculture to other occupations, it has been the cause of their removal. That more have not so removed is, of course, due to the

<sup>1</sup> See p. 93.

<sup>2</sup> See p. 13.

<sup>3</sup> See p. 15.

<sup>4</sup> See p. 93.

<sup>5</sup> See p. 13.

fact that the farm work of the present day calls for a great amount of work not demanded by the business of farming as followed in earlier years.

The matter of change in the character of farm work has made it very difficult for any one, from ordinary observation alone, to judge rightly of the effect of machine power on labor. Even so eminent an authority on agricultural conditions as Professor Davenport, of the University of Illinois, has been misled into thinking that the labor power supplanted by machinery is offset by the demand for labor in new lines of farm work. In his testimony before the Industrial Commission he stated: "The introduction of machinery has vastly extended agricultural operations. It has extended the acreage under cultivation, and has increased the amount of labor bestowed upon the land per acre. I do not think it has decreased the number of men or the total employment of man power on the lands of the country."<sup>1</sup>

It is barely possible that Professor Davenport and the members of the Industrial Commission who examined him, had reference to the absolute and not to the relative number of workers. If such was the case then all that can be said is that Professor Davenport and the commissioners were rather solemnly deliberating upon a subject concerning which the successive census reports left no room for doubt.

But, one may ask, What becomes of the workers who are thus thrown out of employment? and, Are there not some compensating advantages? The first of these questions is easily answered for in the extreme case of an individual who suffers absolute displacement the only alternative from idleness is to accept a lower

<sup>1</sup> Report of the Industrial Commission, Vol. X, page 256. See also the testimony of Mr. Ketchum on page 132 of that report.

rate of wages for work in his accustomed employment or to enter as an inexperienced workman, in some other employment at, most likely, a still lower rate of wages. His compensating advantage is an uncertain one and one hard to estimate. Besides, it does not ordinarily accrue until the time of his greatest need is passed.<sup>1</sup> It arises from the decreased market price of the commodity which he formerly helped to produce. If it is a commodity which enters into his own consumption then the lower price which he pays for it, will in a measure, off-set the lower wage which he receives in his new occupation. If it is not a commodity which enters into his own consumption then his compensating advantage must come through the stimulus which the decreased price of this particular commodity gives to other industries in which it is employed as "raw material" or, more properly, as a factor of production. Cheaper "raw material" yielding, of course, a decreased cost of production, higher profits, and a stronger demand for labor.<sup>2</sup>

<sup>1</sup> "It is small consolation to a working man to be assured that in a year's time he will have plenty of work, if in the meantime he must remain breadless. Loss of work even for a few weeks may exhaust his credit and the affection and means of his friends, and there may remain nothing for him but starvation, unless poor-laws or private charity come to the rescue."—Nicholson: *Effects of Machinery on Wages*, p. 30.

<sup>2</sup> "Labor-saving methods seem to be a calamity, because the effect is to interfere with present pursuits and deprive some of their accustomed means of livelihood; to render useless, skill acquired after a lifelong training. The benefits all seem to accrue to the person who first uses an invention, while the ones displaced are apparently shut out of the industrial system. It is not noticed how they are gradually absorbed into other channels of employment that open up as the cost of production is decreased. If such were not the case, the whole industrial mechanism would soon come to a standstill, considering the progress of inventions supplemented by the army of aliens that arrive yearly and the increasing proportion of women breadwinners."—Henry White: "The Problem of Machinery" in *The American Federationist*, Vol. X, page 83.



As to those workmen who suffer only relative displacement there is, ordinarily, no need for any compensating advantages. The greatest hardship which the use of machinery lays upon them is that of avoiding those occupations in which the demand for workmen is becoming weak. It will be noticed too, that for every relative decrease in the number of persons engaged in one industry, there is a corresponding increase in some other industry.<sup>1</sup> As a matter of fact the persons engaged in gainful occupations constitute a greater proportion of the total population now than formerly.<sup>2</sup>

<sup>1</sup> See pp. 37-38.

<sup>2</sup> **MALES AND FEMALES TEN YEARS OF AGE AND OVER IN THE UNITED STATES.**

<i>Year</i>	<i>Total number</i>	<i>Engaged in gainful occupations.</i>	<i>Per cent</i>
1900 . . .	57,949,824 . . .	29,074,117 . . .	50.2
1890 . . .	47,413,559 . . .	22,735,661 . . .	48.0
1880 . . .	36,761,607 . . .	17,392,099 . . .	47.3
1870 . . .	28,228,945 . . .	12,505,923 . . .	44.3

Ranged on the common basis of 100, for the purpose of comparison, the two columns of absolute numbers in the above table show as follows:

**MALES AND FEMALES TEN YEARS OF AGE AND OVER IN THE UNITED STATES.**

<i>Year</i>	<i>Total number</i>	<i>Engaged in gainful occupation</i>
1900 . . . . .	205.2 . . . . .	232.5
1890 . . . . .	168.0 . . . . .	181.8
1880 . . . . .	130.2 . . . . .	139.1
1870 . . . . .	100.0 . . . . .	100.0

These figures show an unmistakable increase in the proportion of those engaged in clearly defined occupations. There are, however, two points which should be borne in mind in any comparative study of the census returns of occupations.

First: the more elementary the industrial organization, the less differentiated are the industrial functions, and hence the proportion of those who can report themselves as having definite occupations is much less than in a highly developed industrial organization in which the workmen are much given to following special lines of work.—(Tenth Census, Population I, page 710.)

Second: The number of different occupations reported upon has

# THE AGRICULTURAL WORK OF FORMER TIMES IN THE TOWNS OF TO-DAY

The element of unreality in the transfer from agriculture to other occupations, referred to above (page 39), consists in this, that many of those who, at the present time, are employed in the towns and considered as engaged in occupations other than agriculture, are, in fact, doing work which, in earlier years, was done on the farms; and the persons who then did the work, if classified at all, were classified as agriculturists.

There is no need to cite authority for saying that 150 years ago, not in this country alone but in all countries, much of that which we now call manufactures was considered a part of agriculture. Agricultural implement manufacture, as a distinct industry, was then practically unknown. Each farmer, assisted, perhaps, by the village blacksmith, made his own implements. "Every homestead of any pretension had to be, at the same time, a manufactory of almost all the things required for daily use." "Every housewife spun her own flax and made her own linen."<sup>2</sup> Even within

been repeatedly changed: the number of different occupations reported upon by the several censuses has been as follows:

Twelfth Census . . . . .	303	} Twelfth Census, Occupations, p. xxxii.
Eleventh Census . . . . .	218	
Tenth Census . . . . .	265	
Ninth Census . . . . .	338	
Eighth Census . . . . .	584	
Seventh Census . . . . .	323	

Any one will readily recognize that the more minute the classification of occupations the higher must be the proportion of those in gainful occupations as compared with the whole population.

<sup>1</sup> Smith: *Colonial Days and Ways*, page 110.

<sup>2</sup> McMaster: *History of the People of the United States*. Vol. I, p. 10.

the past fifty years, the business of ginning cotton has been largely removed from the farm;<sup>1</sup> and, in the report of the Twelfth Census, cotton ginnerers are classed as manufacturers.<sup>2</sup> The business of cotton ginning like that of grinding corn and wheat, has become specialized and has been removed from the farm. Its classification as a line of manufactures followed, of necessity. The Twelfth Census classifies butter and cheese makers as manufacturers;<sup>3</sup> but in 1870, only the cheese makers were so classified.<sup>4</sup> Butter was made, in 1870, on the farms and as part of farm work. The development of the agricultural implement industry is another instance. The manufacture of the implements and machines from being a feature of farm work,<sup>5</sup> has become a distinct branch of manufactures, employing, according to the returns of the Twelfth Census, during the census year reported upon, an "average number" of 46,582 persons besides 10,046<sup>7</sup> "salaried officers, clerks, etc."

Thus, one after another, functions which formerly were considered as belonging to agriculture have been differentiated from it and removed from the farm,

<sup>1</sup> Twelfth Census, Agriculture I, p. xxx.

<sup>2</sup> Twelfth Census, Population II, p. 507.

<sup>3</sup> Twelfth Census, Population II, p. 506.

<sup>4</sup> Ninth Census, Population, p. 680.

<sup>5</sup> Rogers : Industrial and Commercial History, p. 26.

<sup>6</sup> "The average number of wage-earners (men, women, and children) employed during the entire year was ascertained by using 12, the number of calendar months, as a divisor into the total of the average numbers reported for each month." Twelfth Census : Bulletin No. 69, p. 2.

<sup>7</sup> Twelfth Census, Manufactures IV, page 345. "More than two hundred thousand employees are provided with regular work the year round by the factories that make the implements and machinery, and nearly as many more are engaged in selling, transporting and shipping the products to their final destination."—Geo. E. Walsh ; Machinery in Agriculture, in *Cassier's Mag.*, Vol. 19, p. 147.

until the farming business of to-day appears as a remnant of its former self. He is much mistaken, however, who would, from this fact, conclude that the farmer is sinking to the level of a wage-earner. One ought rather to say that it is a sign of the farmer rising to the position of a merchant or manufacturer. It is specializing his work; it is taking away only that which can be more advantageously done in the towns, and leaving to him just that which he can do most advantageously and, therefore, most profitably. It is lifting him to that place in the industrial organism in which his share in the production of economic goods counts most effectively.<sup>1</sup> The underlying and controlling fact is this: that the more highly organized society becomes, the farther it advances along the way from barbarism to a perfect civilization, the more does each individual member of society become dependent upon the offices of every other member.

The transfer of occupations from the country to the town is still going on and will go on until division of labor and labor saving devices shall have ceased to serve their purpose. It is in the nature of things that this should be so, since it can be done more economically; and it is equally in the nature of things that people should compete for the better conditions thus offered. It is in vain to try to keep the boy upon the farm where the work is slipping from his grasp. He must

<sup>1</sup> "Better methods of husbandry, the use of superior implements, specialization of agricultural production and vastly improved transportation facilities, whereby large areas of new lands have been brought under cultivation, have been indispensable to this increase in productive efficiency, in consequence of which a relatively smaller part of the world's population is required to produce the food supply."—C. F. Emerick: *Agricultural Discontent*," in *Pol. Sci. Quar.*, Vol. XI, p. 436.

follow his work. The zeal which some townspeople manifest in their efforts to persuade the farmers' boys to remain upon the farm betrays a fear that the advent of vigorous blood may diminish the profit which now arises by reason of the somewhat restricted number of competitors.

It must, however, be noted that the introduction of farm machinery is developing work on the farm very much akin to that done in the town, as for example, the cutting and grinding of feed for stock. It minimizes the disagreeable features of farm work,<sup>1</sup> and is giving opportunity for the exercise of a higher order of intellect in farm work.<sup>2</sup> Many advantages, formerly attainable only in towns, are now accessible to the farming classes<sup>3</sup> so that, at the present time, many of the more capable farmers' boys are finding farm life to be the more advantageous avenue to the wealth and social position which they seek.

<sup>1</sup> "The introduction of machinery in many branches of industry—and more especially in agriculture—while increasing, perhaps, the monotony of employment, has also greatly lightened the severity of toil, and in not a few instances has done away with certain forms of labor which were unquestionably brutalizing and degrading, or physically injurious."—David A. Wells: *Recent Economic Changes*, p. 372.

"There is no more laborious kind of farm work than the spreading of manure; so much so that in farming on a large scale it is difficult to procure labor for the purpose. This can now be dispensed with. A machine called the manure spreader does all this work . . . It does everything in the manuring line except to use foul language."—*Scientific American Supplement*, Vol. 50, p. 20528.

<sup>2</sup> "The farmer has, by his own progressiveness, gained a better standing in business and in social life than he formerly held. The conditions on New England farms are now such as to attract men of brains and intelligence."—Chas. S. Phelps: "Is there a decadence of New England Agriculture," in *New England Magazine*, Vol. 25, p. 383.

<sup>3</sup> See page 71, *et seq.*

THE EFFECT OF THE USE OF MACHINERY UPON THE SIZE  
OF FARMS AND THE RESULTING RELATIONSHIP BE-  
TWEEN THE DEPENDENT AND THE INDEPENDENT  
FARMING CLASSES

The average size of farms of the Continental United States, and in the several divisions, as shown by the successive census returns from 1850 to the present, given in acres, is as follows :<sup>1</sup>

	1900	1890	1880	1870	1860	1850
United States . .	147.0 . .	136.5 . .	133.7 . .	153.3 . .	199.2 . .	202.6
N. Atl. div. . . .	97.5 . .	95.3 . .	97.7 . .	104.3 . .	108.1 . .	112.6
S. Atl. div. . . .	109.1 . .	133.6 . .	157.4 . .	241.1 . .	352.8 . .	376.4
N. Cent. div. . . .	145.2 . .	133.4 . .	121.9 . .	123.7 . .	139.7 . .	143.3
S. Cent. div. . . .	156.0 . .	144.0 . .	150.6 . .	194.4 . .	321.3 . .	291.0
Western div. . . .	393.5 . .	324.1 . .	312.9 . .	336.4 . .	366.9 . .	694.9

An inspection of the foregoing table shows that for the period from 1850 to 1880, for the whole United States and for each division, except the South Central, in 1860, there was a constant tendency toward smaller farms. In the North Atlantic and South Central divisions this tendency is shown to have been still in operation in 1890 and the average size of farms in the North Atlantic division in 1900, although greater than in 1890, was still a trifle below the average shown for 1880. In the South Atlantic division the tendency toward smaller farms has continued unbroken to the present time; but otherwise, for the several divisions and for the United States, as a whole, the year 1880 marks the point of the smallest average sized farms. The returns subsequent to that date, except in the cases noted, show a marked increase in the average size of farms.

The total area in farms may, however, be somewhat misleading, when considered as an index of the extent

<sup>1</sup> Twelfth Census, Agriculture I, page 688.

of farming operations subject to the influence of machinery, as will clearly appear upon a comparison of the data in the table last above given with those of the following table showing the average number of acres of improved land, per farm, 1850-1900, inclusive.<sup>1</sup>

	1900	1890	1880	1870	1860	1850
United States . . .	72.7 . .	78.3 . .	71.0 . .	71.0 . .	79.8 . .	78.0
N. Atl. div. . . .	57.4 . .	64.3 . .	66.6 . .	68.3 . .	69.0 . .	69.3
S. Atl. div. . . .	47.9 . .	55.6 . .	56.1 . .	80.7 . .	115.6 . .	120.9
N. Cent. div. . . .	101.2 . .	95.8 . .	80.6 . .	69.7 . .	67.7 . .	61.0
S. Cent. div. . . .	48.3 . .	61.0 . .	56.2 . .	60.8 . .	89.7 . .	82.6
Western div. . . .	111.8 . .	157.8 . .	185.9 . .	168.1 . .	106.4 . .	51.8

By this table it appears, that the lowest average number of acres of improved land per farm, for the United States, as a whole, was reached in 1870; that this average was the same in 1880; and that while it rose somewhat in 1890, it fell again in 1900 almost to the level for 1870 and 1880. Turning to the several divisions we find that, with but one exception, the movement toward smaller farms continues and is apparent in the returns for 1900. The one exception is, however, all important in this discussion for it is the North Central division, the one above all others devoted to the use of farm machinery, and in this division it is shown, not only for the period from 1880 but for the whole period from 1850 to 1900, that there has been a strong and unvarying increase in the average number of acres of improved land per farm, rising from an average of 61.0 acres in 1850 to 101.2 acres in 1900.

The average number of acres in crops is a still better index to the extent of farming operations. Unfortunately, this average cannot be given for the whole of the period from 1850 to 1900; but for the more im-

<sup>1</sup> Twelfth Census, Agriculture I, p. xxii.

portant part of that period, namely from 1880 to 1900, it can be given with tolerable completeness. The following table shows the

AVERAGE NUMBER OF ACRES IN ALL FARM CROPS,<sup>1</sup> PER FARM OF TEN ACRES AND OVER IN 1880, 1890, and 1900.<sup>2</sup>

	1900	1890	1880
United States . . . . .	49.8	48.6	42.6
North Atlantic div. . . . .	35.1	35.7	33.7
South Atlantic div. . . . .	29.4	33.4	36.2
North Central div. . . . .	73.0	65.1	51.5
South Central div. . . . .	33.6	34.3	34.6
Western div. . . . .	68.5	68.4	64.5

This last table agrees, in a general, with the corresponding portion of the table showing the average number of acres of improved land per farm; but it is to be noted that, according to the table now presented, the average crop area per farm is less, for the years 1890 and 1900 than for the year 1880, in only two divisions; namely, the South Atlantic and South Central. In each of the other divisions, and for the United States, as a whole, the average crop acreage per farm, both for 1890 and 1900, is greater than in 1880. The movement toward a larger average crop acreage is especially strong in the North Central division.

The relative strength of the tendency toward a greater average crop acreage per farm will be more readily appreciated if the facts disclosed in the foregoing table are presented from the basis of a common denominator, as follows:

<sup>1</sup> For acreage in all farm crops see p. 102.

<sup>2</sup> Number of farms derived from Twelfth Census, Agriculture I, pp. 688 and 690.



INDEX NUMBERS REPRESENTING THE AVERAGE NUMBER OF ACRES IN ALL FARM CROPS, PER FARM OF TEN ACRES AND OVER IN 1880, 1890, AND 1900

	<i>Base</i>	<i>1880</i>	<i>1890</i>	<i>1900</i>
United States . . . . .	42.6 = 100	. . . . .	114.1 . . . . .	116.9
North Atlantic div. . . . .	33.7 = 100	. . . . .	105.9 . . . . .	104.2
South Atlantic div. . . . .	36.2 = 100	. . . . .	92.3 . . . . .	80.9
North Central div. . . . .	51.5 = 100	. . . . .	126.4 . . . . .	141.8
South Central div. . . . .	34.6 = 100	. . . . .	99.1 . . . . .	97.1
Western div. . . . .	64.5 = 100	. . . . .	106.0 . . . . .	106.2

There are three principal causes which have operated to produce the different conditions disclosed by this last table.

First: As between the North and South, there is a difference in the character of the workers. The negro workmen, as compared with the white workmen in the North and West, are lacking in the intelligence requisite for conducting extensive farming operations, as also for the using of machine power advantageously. This, coupled with the breaking up of the old plantation system, has tended to give smaller farms in the South Atlantic and South Central divisions.<sup>1</sup>

Second: The character of the principal crops cultivated in the Southern states are those in the cultivation of which, as compared with the crops raised in the Northern states, machine power is but little used. The only machine which plays any considerable part in the production of the distinctively Southern crops, is the cotton gin and the influence of this machine was in full operation long before the year 1880; whereas the influence of the machines used in the production of the distinctively Northern crops was, at that time, only fairly well under way.

Third: As between the North Atlantic, North Cen-

<sup>1</sup> Hammond: Cotton Industry, pp. 123-129.

tral and Western divisions, the character of the cultivation affects the size of farms. The North Atlantic states are much devoted to market gardening and the general character of farm work in that division is, therefore, more intensive and a given area gives employment for a greater quantity of both machine and man-labor power. The Western states, in like manner, much more than the North Central states, are devoted to market garden and orchard products.<sup>1</sup> The North Central states lead in what may be termed field crops.<sup>2</sup>

Looking to the total farm acreage, it may seem questionable whether the effect of machinery is to increase or decrease the size of farms. But it is noticeable that the total farm acreage includes land kept for stock-raising, for timber supply, for speculation, etc., and includes altogether too much of that with which machinery has nothing to do, to make it a fit basis for a study of the influence of farm machinery either upon the size of farms or upon the nature and extent of farm work. When we use the word "farm" to denote only that portion of the land with which machinery has to do (*i. e.*, the area devoted to the production of crops), it becomes apparent that, other things being equal, the use of farm machinery leads to, or is at any rate accompanied by, an increase in the size of farms. This increase is most marked in the states of the North Central division.

#### SOME CONSEQUENCES RESULTING FROM THE USE OF FARM MACHINERY IN THE REGION MOST DEVOTED TO ITS USE

It has been shown that the cereal and hay crops are those in the production of which machine power

<sup>1</sup> See Twelfth Census, Agriculture II, pp. 324 and 599 *et seq.*

<sup>2</sup> See pp. 52-53.

plays the greatest part. It now becomes needful to know the relative importance of the cereal and hay crops in the different divisions of the country. The following table shows for the United States and for the several geographical divisions, the total number of acres in all crops; the total number of acres in cereals and hay; and the per cent. which the total acreage in the cereals and hay bears to the total crop acreage, as reported by the census of 1900.

	<i>Total crop acreage<sup>1</sup></i>	<i>Total acreage in cereals and hay<sup>2</sup></i>	<i>Per cent</i>
United States . . . .	289,734,591	246,674,289	85.1
North Atlantic div. . . .	24,683,365	21,876,493	88.6
South Atlantic div. . . .	29,194,661	19,125,863	65.5
North Central div. . . .	163,000,561	155,000,940	95.1
South Central div. . . .	56,233,143	35,405,091	62.9
Western div. . . . .	16,622,861	15,265,902	91.8

For the purpose of further narrowing the field of investigation, it may be assumed also, as a matter of common knowledge, that, although machinery is much used in the production of hay, the work of hay production constitutes relatively but a small portion of the total work requisite for the production of both cereals and hay. It is, therefore, the cereal producing regions to which we must look for the most marked effects of the use of farm machinery.

The following table, taken from the report of the Twelfth Census,<sup>3</sup> indicates the distribution of the cereal crops and the relative importance of the cereal crops, from the standpoint both of acreage devoted to their production and of the value of the product as compared with the acreage and value of all crops.

<sup>1</sup> Twelfth Census, Agriculture II, p. 62.

<sup>2</sup> See p. 102.

<sup>3</sup> Twelfth Census, Agriculture II, p. 62.

	<i>Per cent of acreage of all crops in cereals</i>		<i>Per cent of value of all crops in cereals</i>		<i>Average value per acre of</i>	
					<i>all crops</i>	<i>cereals</i>
United States . . . . .	63.8	51.0	\$10.04	\$ 8.02		
North Atlantic div. . . . .	36.3	26.6	15.19	11.14		
South Atlantic div. . . . .	58.1	33.6	11.32	6.55		
North Central div. . . . .	73.2	71.1	8.42	8 18		
South Central div. . . . .	56.1	36.3	10.99	7 12		
Western div. . . . .	49.4	37.0	11.59	8.69		

The North Central division ranked first in the production of cereals, not only in 1899, but also in 1889 and in 1879.<sup>1</sup> It ranked first also in the production of hay.<sup>2</sup> That it is the region of increasing average size of farms<sup>3</sup> and of increasing crop acreage per person engaged in farm work<sup>4</sup> has already been shown. The North Central states will, therefore, furnish the best field for a study of the effects of farm machinery.

Among the states of the North Central division there were seven which, for the year 1899, reported that over 70 per cent. of their total crop acreage was in cereals and also that the value of their cereal crops for that year constituted more than 70 per cent. of the value of their total crop production.<sup>5</sup> The seven states and the per cent. of their reported cereal acreage and cereal crop values to their total crop acreage and crop values, respectively, are as follows:<sup>6</sup>

<sup>1</sup> Twelfth Census, Agriculture II, p. 63.

<sup>2</sup> Twelfth Census, Agriculture II, p. 215.

<sup>3</sup> See pp. 47-50.

<sup>4</sup> See pp. 16-17.

<sup>5</sup> Oklahoma is the only other State, or Territory, in the Union which reported so high a per cent of acreage and value in cereals for the year 1899. But no separate report was returned for Oklahoma in 1880 and it is, therefore, necessarily omitted from this study.

<sup>6</sup> Twelfth Census, Agriculture II, p. 62.

State	Cereal Acreage, of total crop acreage. Per cent	Cereal Value, of total crop value. Per cent
Illinois . . . . .	80.4	77.6
Iowa . . . . .	76.3	76.9
Kansas . . . . .	72.5	74.2
Nebraska . . . . .	79.7	82.3
Minnesota . . . . .	74.0	75.9
North Dakota . . . . .	71.7	74.4
South Dakota . . . . .	70.2	78.3

The hay and forage acreage of these seven states, in 1899, was 35.6 per cent. of the total hay and forage acreage of the United States<sup>1</sup> and their acreage in cereals and hay and forage was 96.6 per cent. of their own total crop acreage.<sup>2</sup> These seven states constitute, therefore, a region in which the cultivated area is almost wholly devoted to the production of those crops in the cultivation and handling of which farm machinery is most used. Their acreage in the different farm crops, as reported to the Census Office, for the period of 1880-1900 was as follows:

	1900	1890	1880
Cereals <sup>3</sup> . . . . .	82,116,414	58,522,442	39,923,160
Hay and forage <sup>4</sup> . . . . .	22,010,381	19,770,323	7,998,365
Tobacco <sup>5</sup> . . . . .	2,587	4,500	6,906
Hops <sup>6</sup> . . . . .	911	46	103
Cotton <sup>7</sup> . . . . .	153	731	
Totals . . . . .	104,130,446	78,298,042	47,928,534

The average acreage in farm crops, per farm of ten acres and over<sup>8</sup> was, in 1880, 64.4 acres; in 1890, 86.2

<sup>1</sup> Twelfth Census, Agriculture II, p. 215.

<sup>2</sup> The total crop acreage of these seven States in 1899 was 108,394,908 acres—Twelfth Census, Agriculture II, p. 62.

<sup>3</sup> Twelfth Census, Agriculture II, p. 63.

<sup>4</sup> *Idem*, p. 215.

<sup>5</sup> *Idem*, p. 527.

<sup>6</sup> *Idem*, p. 540; Eleventh Census, Agriculture II, p. 91 *et seq.*

<sup>7</sup> Twelfth Census, Agriculture II, p. 424.

<sup>8</sup> Tracts of less than ten acres are excluded as being vegetable, or truck farms, rather than farms for the raising of the crops here considered. For number of farms, see Twelfth Census, Agriculture I, pp. 688 and 690.

acres; in 1900, 102.5 acres. The average acreage in all farm crops, per person cultivating such crops,<sup>1</sup> was, in 1880, 40.6 acres; in 1890, 53.9 acres; in 1900, 62.4 acres.

Presenting these data in form to show the relative rates of increase, we have the following:

	Base	1880	1890	1900
Average acreage in all farm crops per farm . . . . .	64.4	= 100	. . . 133.9	. . . 159.2
Average acreage in all farm crops per person cultivating same . . . . .	40.6	= 100	. . . 132.8	. . . 153.7

The tendency in machine using states, toward a greater crop acreage per farm and per person, is strong and unmistakable.<sup>2</sup>

The persons who cultivated these crops are classified as follows:<sup>3</sup>

	1900	1890	1880
Agricultural laborers <sup>4</sup> . . . . .	612,418	. . 359,894	. . 352,565
Farmers, planters and overseers . . . . .	1,056,237	. . 1,091,867	. . 828,800
Totals . . . . .	1,668,655	1,451,761	1,181,365

Presented from the basis of a common denominator, these data show rates of increase as follows:

<sup>1</sup> Agricultural laborers, farmers, planters and overseers.

<sup>2</sup> "With the coming of the great harvesters, the planters, cultivators, and scores of other farm mechanisms there was an opportunity to double and quadruple the crops and the farms gradually increased from ten and twenty acres to one and two hundred."—Geo. E. Walsh: "Machinery in Agriculture," in *Cassiers Mag.*, Vol. 19, p. 139.

<sup>3</sup> See table of absolute numbers, p. 100.

<sup>4</sup> This includes 4,264 garden and nursery laborers in the returns for 1900 and probably one-half as many of the same in the returns for 1890 and for 1880; but they were not separately reported by the Tenth and Eleventh Censuses, and hence cannot be discarded.

	Base	1880	1890 <sup>1</sup>	1900
Agricultural laborers . . . . .	352,565	= 100 . .	102.1 . .	173.6
Farmers, planters, and overseers . .	828,800	= 100 . .	131.7 . .	127.4

Disregarding the returns of the Eleventh Census, let us consider what these per cents indicate. Starting in 1880 with a given ratio between the number of farm employees and employers, we find that in twenty years the employed, or dependent class, has increased 73.6 per cent while the employing, or independent class, has increased only 27.4 per cent. In other words, during the twenty year period from 1880 to 1900, the dependent increased 46.2 per cent more rapidly than did the independent class. With these figures in mind, one needs but a moment's reflection to satisfy himself that, at the rates of increase indicated, the dependent class of farm operators must soon outnumber the independent class.<sup>2</sup> There is no need here for ar-

<sup>1</sup>The returns of the Eleventh Census are known to have been very defective in this, that "farmer's sons and daughters were often reported as farmers rather than as farm laborers, thus very much complicating the occupation returns in this class."—(Letter of Carroll D. Wright, under date of Dec. 29, 1899.) That some such error must have crept into the returns is evident on a consideration of the rate of increase of the two classes (*i. e.*, "agricultural laborers" and "farmers, planters, and overseers"), when taken together. The combined rate of increase appears as follows:

	Base	1880	1890	1900
Agricultural laborers, farmers, planters and overseers . . .	1,181,365	= 100 . .	122.9 . .	141.2

These figures show that the total population engaged in farming increased at a uniform rate and there seems no good reason for supposing that there was in fact any such extraordinary movement from the class of employees to the class of employers and then back again within the period of twenty years from 1880 to 1900, as indicated by the returns.

<sup>2</sup>"Of these evils that which is most serious and general is the divorce which machinery is bringing about between labor and capital. So far has this already gone that people have come to think of the two as things naturally distinct from each other, and to regard it as a normal state of affairs that the persons who perform the manual toil of a country shall be absolutely dependent for employment on a com-

gument that a large dependent class is dangerous to society.<sup>1</sup>

The reason for this condition of affairs has been already indicated. The profitable use of a machine requires that it shall have a field of operation suited to its capacity;<sup>2</sup> just as a man, in order that he may work to best advantage, requires more and heavier labor than that suited to a boy. Hence the movement toward larger farms and greater average crop acreage per farm so noticeable in the machine using states. Moreover, the larger farms call for a corresponding increase in the amount of capital at the command of the farmer, especially when, as in this country, there is a tendency toward more intensive cultivation. This is equally true whether the farmer be an owner or a tenant. The

paratively small class known specifically as capitalists, in whose hands are concentrated the implements with which alone modern industry can be successfully carried on. That such dependence is unfavorable to the highest type of manhood will hardly be questioned; and the enormous extent to which machinery has increased and is still increasing the percentage of persons subject to such dependence is surely a most serious matter. The manhood of a nation is its most precious possession, for the loss or deterioration of which no increase of material wealth can adequately compensate."—Edward T. Peters: *Some Economic and Social Effects of Machinery*, p. 2.

<sup>1</sup>In 1890 the proportion of male agricultural laborers reported as unemployed during some portion of the census year was 17.2 %; in 1900 it was 36.1 %. Females, in 1890, 18.6 %; in 1900, 44.3 %.—Twelfth Census, Occupations, pp. ccxxviii–ccxxxi.

<sup>2</sup>"In order to make the steam power machines of value, the farms must be large and extensive. On small farms, they would prove too costly either in the operation or initial expense. For this reason it has been said that steam power could never supplant horse power on the farms, for our democratic notions demand that farming-lands shall never be consolidated in the hands of a few, and farming on a gigantic scale can never represent more than a very limited part of the industry in this country. Yet the tendency in the West is to operate enormous farms, combining several rather than cutting up into smaller ones."—Geo. E. Walsh: "Steam Power for Agricultural Purposes," in *Harper's Weekly*, Vol. 45, p. 567.



increasing amount of capital requisite for farm proprietorship makes it more and more difficult for a member of the dependent class (*i. e.*, an agricultural laborer), to become a proprietor.<sup>1</sup> His option to work for himself or to work for wages is more and more qualified, and hence the greater proportionate increase in the membership of the dependent class. That there has been a constant increase in the amount of capital requisite for farm proprietorship will be evident from an inspection of the following data, showing for this group of seven states, as reported to the Census Office :

1. The average value, per farm, of all farm property, including land with improvements, implements and machinery, and livestock was in 1880, \$3,515; in 1890, \$4,859; in 1900, \$6,531.<sup>2</sup>

2. The average value, per farm, of lands with improvements, including buildings was in 1880, \$2,835; in 1890, \$3,930; in 1900, \$5,358.<sup>3</sup>

3. The average value, per farm, of implements and machinery on farms: In 1880, \$136 was in 1890, \$151; in 1900, \$208.<sup>4</sup>

The rate at which these several factors have increased will appear in the following :

<sup>1</sup> "No English agricultural labourer, in his most sanguine dreams, has the vista of occupying, still less of possessing, land. He cannot rise in his calling. He cannot cherish any ambition, and he is in consequence dull and brutish, reckless and supine."—Rogers: *History of Agriculture and Prices*, Vol. I, p. 693.

<sup>2</sup> Twelfth Census, Agriculture I, pp. 688 and 694.

<sup>3</sup> *Idem.*, pp. 688 and 696.

<sup>4</sup> *Idem.*, pp. 688 and 698.

	<i>Base</i>	<i>1880</i>	<i>1890</i>	<i>1900</i>
Average value of all farm property \$	3,515 = 100 .	138.2 .	185.8	
Average value of farms (land and improvements) . . . . .	2,835 = 100 .	138.6 .	189.0	
Average value of implements and machines . . . . .	136 = 100 .	111.0 .	152.9	
Farmers, planters and overseers . .	828,800 = 100 .	— .	127.4	
Agricultural laborers . . . . .	352,565 = 100 .	— .	173.6	

## WAGES UNDER HAND AND UNDER MACHINE METHODS

### DAILY WAGES—WAGES OF SKILLED AND UNSKILLED WORKMEN

Touching the matter of daily wages for the same work under hand and under machine methods of production, the Thirteenth Annual Report of the Department of Labor is, probably, the best source of information. That report shows, in typical cases, the rates of wages paid for the different kinds of work required in the production of twenty-seven different farm crops by hand and by machine methods. The data in twenty-six cases are available for our present purpose.

It appears by that report that the lowest wage customarily paid, in the season of 1829-30, to any workman engaged in the production of wheat, by hand method, was 50 cents; the highest 75 cents. In 1895-96, the lowest daily wage reported for workmen engaged in the production of wheat, by machine method, was \$1.50; the highest, \$4.50. The average rate of wages for this work, in 1829-30, was 57 cents; in 1895-96, it was \$2.47.<sup>1</sup> Collecting similar data from each of the twenty-six sets of usable returns, we have the following:

<sup>1</sup>The average here used is a weighted average, secured by dividing the total amount of wages paid by the total number of days work performed at the different rates of wages.

## DAILY WAGES

Unit No.	Crop.	Hand Labor Date.	Machine Labor Date.	Hand Method.		Machine Method.		Av. Daily Wages.	
				Low-est.	High-est.	Low-est.	High-est.	Hand.	Machine.
1	Apple Tree . .	1870-2	1893-5	\$ .85	\$2.00	\$ .85	\$2.00	\$1.56	\$1.59
2	Apple Tree . .	1869-71	1893-5	.85	2.00	.85	2.00	1.56	1.28
3	Barley . . . .	1829-30	1895-6	.50	.75	1.50	4.50	.56	2.21
4	Beets . . . . .	1850	1895	.40	.75	1.00	1.00	.69	1.00
5	Broom Corn . .	1860	1895	.50	1.00	1.25	1.50	.99	1.25
6	Carrot . . . . .	1855	1895	.40	.75	.75	1.25	.62	1.01
7	Carrot . . . . .	1850	1895	.40	.75	.75	1.25	.72	.90
8	Corn . . . . .	1855	1894	.75	1.00	1.00	2.50	.78	1.53
9	Corn . . . . .	1855	1894	.50	1.00	1.00	1.00	.94	1.00
10	Cotton . . . . .	1841	1895	.50	.50	.50	1.00	.50	.99
11	Hay . . . . .	1860	1894	.50	1.00	.75	1.25	.86	1.11
12	Hay . . . . .	1850	1895	.50	1.00	.75	1.25	.83	1.05
13	Oats . . . . .	1830	1893	.50	.75	1.25	2.50	.56	1.50
14	Onion . . . . .	1850	1895	.40	.75	.75	1.25	.70	1.00
15	Peas . . . . .	1856	1895	1.62½	1.62½	1.00	2.00	1.62½	1.04
16	Potato . . . . .	1866	1895	1.00	1.00	1.00	1.00	1.00	1.00
17	Rice . . . . .	1870	1895	1.00	1.00	.65	.65	1.00	.65
18	Rye . . . . .	1847-8	1894-5	1.63	1.75	1.00	2.00	1.65	1.05
19	Strawberry . .	1871-2	1894-5	.	.	.	.	1.30	1.38
20	Sugar Cane . .	1855	1895	1.00	1.00	.65	.65	1.00	.65
21	Sweet Potato . .	1861	1895	.50	1.00	.40	.80	.76	.62
23	Tobacco . . . .	1844	1895	1.75	1.75	1.00	1.00	1.75	1.00
24	Tomato . . . . .	1870	1895	.50	1.00	.	.	.93	.91
25	Turnip . . . . .	1855	1895	.40	.75	.75	1.25	.59	.88
26	Wheat . . . . .	1829-30	1895-6	.50	.75	1.50	4.50	.58	2.00
27	Wheat . . . . .	1829-30	1895-6	.50	.75	1.50	4.50	.57	2.47

\* See footnote "1", p. 21.

It is evident from an inspection of the foregoing table that the variation between the highest and lowest rates of daily wages is much greater under machine methods than under hand methods and that the average rate of wages is much higher under machine methods than under hand methods. An average of averages gives 83 cents for the hand method, \$1.19 for machine method.

Of course, machine power is much more used in the production of some of these crops than in the production of others. In several cases, production is still almost wholly by hand method.<sup>2</sup> In such cases the

<sup>1</sup> With board.

<sup>2</sup> Thirteenth Annual Report, Dept. of Labor, p. 11.

data are not what they appear to be—a showing of hand method as compared with machine method,—but rather only a showing of production by hand method at different dates.

It will be worth our while to inquire in what way the introduction of machine power has affected the rates of wages for the work of producing these different crops. Turning first to a consideration of wages paid in the production of five crops, now largely produced by machine power, we collect the following data :

<i>Unit Number</i>	<i>Crop</i>	<i>Average daily wages</i>	
		<i>Hand</i>	<i>Machine</i>
3	Barley . . . . .	\$.56	\$2.21
8	Corn . . . . .	.78	1.53
11	Hay . . . . .	.86	1.11
13	Oats . . . . .	.56	1.50
27	Wheat . . . . .	.57	2.47

An average of averages gives 66 cents for the hand methods and \$1.76 for the machine method,—an increase of 166 per cent.

A similar showing for the five crops in which there appears to have been little or no change in the methods of production, is as follows :

<i>Unit Number<sup>1</sup></i>	<i>Crop</i>	<i>Average daily wages</i>	
		<i>Hand</i>	<i>Machine</i>
2	Apple trees . . . . .	\$1.56	\$1.28
16	Potatoes . . . . .	1.00	1.00
19	Strawberries . . . . .	1.30	1.38
21	Sweet potatoes . . . . .	.76	.62
24	Tomatoes . . . . .	.93	.91

An average of averages gives \$1.11 as the average daily wage in the time of hand methods and \$1.04 as the average daily wage in the time of machine methods,—a decrease of 6.7 per cent.

<sup>1</sup> See footnote 1 p. 21.

The position of the unskilled workman<sup>1</sup>, meaning now the workman who is untrained in the use of machinery, is a peculiar one. In a lecture on ballad poetry, delivered at the University of Wisconsin in the Spring of 1903, Professor Moulton, of the University of Chicago, called attention to the fact that before the time of written literature the best literary productions were equally accessible to the free and to the unfree. The slave, as well as his master, might know and enjoy the choicest of literary productions. But, with the invention of writing and, especially, of printing, the best literature came to be put into book form. Books were expensive and the knowledge requisite for using them could be acquired only by a long and difficult course of training. From the very nature of the case, the best literature thus became inaccessible both to the slaves and to the poorer classes of freemen. They could gain no positive advantage from the new invention; and they lost, relatively, by reason of the intellectual gulf which opened between them and those others whose more fortunate stations gave both access to the written or printed volumes and afforded opportunity for learning how to use them.

This same process is now working itself out in the matter of labor and machinery. To the skilled

<sup>1</sup>There is, I think, a great deal of confusion and consequent misunderstanding arising from a loose use of the term "unskilled workman." We speak of paying higher wages to a skilled workman than to an unskilled workman; but, the essential element is not skill but efficiency. Skill, means rather proficiency, or dexterity, in the doing of a particular thing. It has reference to the person. But when we speak of a skilled machine workman, we have reference, not so much to the quality of the worker as to the quality of the work done, that is, to the product of his skill. The degree of skill which the machine workman possesses may, in fact, be much below that of the hand worker whom he displaces; but he is a more efficient workman and, therefore, commands the higher wage.

workman, machinery opens the way to profit and advancement. But to the unskilled workman, it is as a sealed, or unintelligible, book. He does not understand it; and the hopelessness of competing with one who does understand it, only intensifies his consciousness of inferiority and increases the burden of his struggle for existence.<sup>1</sup> Having, ordinarily, neither machinery nor the capacity for using it, he is practically shut out from all chance of participating in its benefits. His wages, of necessity, are limited by the standard of his efficiency. It is inevitable, therefore, that the unskilled laborer should, relatively, at any rate, sink ever lower and lower in the scale of industrial society.

That we have been experiencing a transition period, not only with respect to the agricultural industry<sup>2</sup> but, also, with respect to all other industries, seems almost self-evident. I do not believe that the transition period is passed, nor do I believe that it ever will be safely and finally passed, until the State, in the interest of the general welfare, and in its capacity of agent for the whole social body, shall have provided for and required, as now so all but universally provided for and required, in the more purely intellectual field, that every child shall be taught, at least, the rudiments of industrial art.

<sup>1</sup> "Under conditions where the laborer can offer no resistance and the so-called iron law of wages operates to keep him down to the life line, machinery only adds uncertainty to his other woes. He is, as it were, cut out of civilization. Whenever he presses upward and secures a larger share of an ever enlarging product, machinery becomes an uplifting force."—Henry White: "The Problem of Machinery," in *American Federationist*, Vol. X, p. 86.

<sup>2</sup> "The introduction of improved agricultural implements and machinery during the latter half of the nineteenth century was a development of such importance as to amount to an industrial revolution in agriculture."—Report of the Industrial Commission (1901), Vol. X, p. xiv.

## MONTHLY WAGES—SYMPATHETIC VARIATIONS IN WAGE RATES

McMaster<sup>1</sup> cites authorities showing that, in 1794, "in the States north of Pennsylvania," the wages of common laborers did not exceed three dollars per month, while "in Vermont, good men were hired for eighteen pounds a year, which was equal to four dollars per month, and out of this found their clothes." Speaking of wages, generally, in 1802, he says:<sup>2</sup> "The average rate of wages the land over was . . . . sixty-five dollars a year, with food, and, perhaps, lodging." In 1811, "throughout central Pennsylvania eight dollars per month of twenty-six working days, was paid to farm hands when fed and clothed."<sup>3</sup> At Adrian, Michigan, in 1849, according to an apparently reliable authority: "The most common labor with board is worth from \$50 to \$75 a year. A higher quality, in which some care and responsibility are added, is worth \$100 to \$120."<sup>4</sup> A similar report from Richmond, Massachusetts, made in the same year, states: "Men get from ten to sixteen dollars per month and boarded, for six months commencing in April."<sup>5</sup>

On the period from 1866 to 1899, I quote from a report of the Department of Agriculture,<sup>6</sup> as follows:

<sup>1</sup> McMaster: *History of the People of the United States*, Vol. II, p. 179.

<sup>2</sup> *Idem.* Vol. II, p. 617.

<sup>3</sup> *Idem.* Vol. III, p. 510.

<sup>4</sup> U. S. Patent Office Report, 1849-50, p. 186.

<sup>5</sup> *Idem.* 1849-50, p. 92.

<sup>6</sup> Division of Statistics, *Misc. Bull. No. 22*, p. 16.

WAGES OF FARM LABOR PER MONTH, BY YEAR OR SEASON, WITH BOARD, BY YEARS AND BY GEOGRAPHICAL DIVISIONS.<sup>1</sup>

	1899	1898	1895	1894	1893	1892	1890
U. States .	\$14 07	\$13 43	\$12 02	\$12 16	\$13 29	\$12 54	\$12 45
E. States .	18 21	17 63	17 73	17 15	18 45	17 50	17 71
M. States .	15 93	15 33	15 73	15 60	16 51	15 78	15 61
S. States .	9 70	9 45	8 68	9 04	9 92	10 02	10 10
W. States .	16 70	15 75	15 21	14 96	16 29	15 36	15 00
Mt. States .	25 10	23 94	19 87	19 94	23 37	21 28	20 64
Pac. States .	24 97	23 30	20 54	22 60	25 63	24 25	22 50
	1888	1885	1882	1879	1875	1869	1866
U. States .	\$12 36	\$12 34	\$12 41	\$10 43	\$11 07	\$11 03	\$12 38
E. States .	17 21	16 70	16 92	13 03	16 18	15 29	14 77
M. States .	15 41	15 24	14 71	12 37	14 78	12 25	13 33
S. States .	9 90	9 90	9 92	8 46	8 65	7 03	7 62
W. States .	15 09	15 20	15 60	12 75	13 43	11 36	12 09
Mt. States .	21 99	19 74	27 08	— —	— —	— —	11 78
Pac. States .	25 08	24 37	23 73	25 88	28 12	25 44	29 47

The Department of Agriculture has also reported on the "wages of farm labor per month, by year or season, with board," for the year 1902.<sup>2</sup> The average rate for

<sup>1</sup>The geographical divisions used in this table "are composed as follows: *Eastern States*—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut; *Middle States*—New York, New Jersey, Pennsylvania, Delaware; *Southern States*—Maryland, Virginia, South Carolina, North Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Oklahoma, Indian Territory, Arkansas, Tennessee; *Western States*—West Virginia, Kentucky, Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, South Dakota, North Dakota; *Mountain States*—Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho; *Pacific States*—Washington, Oregon, California." Depart. of Agr.; Division of Statistics, Misc. Bull. No. 22, p. 16.

The data for the years prior to 1879 have been changed to a gold basis and a correction has been made, of what was evidently a clerical error, in the rate reported for the Western States in 1866. For the purpose of making this correction the cost of board in the Western States, in 1866, was assumed to have been the same as in the Pacific States where wages without board were practically the same at that date as in the Western States.

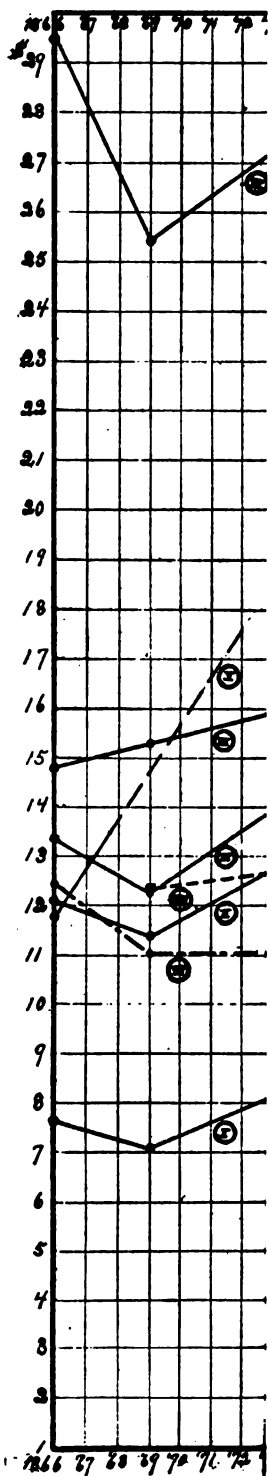
<sup>2</sup>Department of Agriculture (Div. of Stat.), Misc. Bull., No. 26, p. 15.



the whole United States is given as \$16.40; but the average rates for the several geographical divisions are not given. In a letter dated September 16, 1904, the Secretary states that it was deemed unwise for the department so to extend the report on this last investigation. He suggests, however, that for the purposes of this study it would be allowable to make use of such "apparent" averages as are indicated by the published report. Agreeable to this suggestion, I have averaged the wages reported for the states in the several groups and secured the following as the average wage rates in 1902: Eastern States, \$19.85; Middle States, \$16.61; Southern States, \$11.85; Western States, \$19.48; Mountain States, \$28.91; Pacific States, \$27.90. These figures are averages of averages and must, therefore, be taken with some allowance. Accepting, as true, the average rate for the several states, as reported by the department, the rate here given for the Middle States is clearly too low since Delaware, whose wage rate was \$13.81, is given equal weight with New York, whose wage rate was \$19.65. The rate here given for the Pacific States is likewise too low since Oregon, whose wage rate was \$25.98, is given equal weight with California, whose wage rate was \$29.38. For the Southern and for the Western States the rate here given is probably too high, the highest rates being reported for the less populous states. For the other groups the rates here given are approximately correct.

By reference to the accompanying chart it may readily be seen that the average rate of wages for the whole of the United States was somewhat higher in 1899 and in 1902 than in 1866. It is very evident, however, that

Per M





the line of wages for the whole of the United States is very largely controlled by the wage rates in the "Southern States." It is hardly fair to strike an average of wages by considering together the wages of two such different classes of people as the whites and the blacks. We can avoid this incongruity for a considerable portion of the period under consideration.

Taking the number of agricultural laborers in the Mountain, Pacific, Eastern, and Western States *i. e.*, the whole of the United States, exclusive of the Southern States), to have been in 1899, as reported in 1900, we find that the average rate of wages per month, with board, was, in 1899, 17.31.<sup>1</sup> In like manner, the average monthly wage, in the same region, in 1890, is found to have been \$15.81; in 1879 it was \$13.14;<sup>2</sup> in 1869 it was \$12.29.<sup>3</sup> The increase in the average rate per month, during the period from 1869 to 1899, was 40.8 per cent.

<sup>1</sup> In getting this average, I found first the total number of agricultural laborers in each of the geographical divisions named and then found the total wage payment in each group at the rates given in the table on p. 65. The sum of these wage payments divided by the total number of agricultural laborers in all the groups, gives the quotient \$17.31.

<sup>2</sup> The number of agricultural laborers in 1879 is assumed to have been the same as that reported in 1880 and the average rate of wages in the "Mountain States" is assumed to have been the same as was reported for the Pacific States.

<sup>3</sup> The number of agricultural laborers in 1869 is assumed to have been the same as was reported in 1870 and the average rate of wages in the Mountain States is assumed to have been the same as was reported for the Pacific States.

In the matter of the 20,321 agricultural laborers reported by the Ninth Census as being in the Territories, it should be noted that these have been apportioned somewhat arbitrarily, as follows: To the Mountain States, 15,000; to the Pacific States, 1,500; to the Western States, 3,821.

In the matter of general well-being the agricultural laborers, in the North, at any rate, have, of course, shared the homes of their employers; clothing has certainly been cheaper in late years; and, altogether, it seems safe to say that the condition of the dependent white agricultural laborers is much improved.<sup>1</sup>

The accompanying chart discloses a very strong tendency in the wage rates of the different parts of the country, especially in the region where white laborers are employed, to rise or fall together. The reason for this sympathetic fluctuation in rates lies, partly, in the somewhat characteristic dispositions of Americans to go wherever there is a prospect of more profitable employment,<sup>2</sup> and partly in the ready means of communication and

<sup>1</sup> "Eine weitere Verbesserung des Arbeitereinkommens ist in der vermehrten Kaufkraft des Geldes zu suchen. Sowohl die Kleidungsstücke als auch andere Gebrauchsartikel sind durch die hervorragende Anwendung der Maschinenarbeit in der Industrie bedeutend im Preise heruntergegangen; dazu sind auch die Lebensmittel meistens billiger zu kaufen. Der Arbeitslohn ist also nicht nur im allgemeinen absolut, sondern auch im Verhältnis zu dem Preise der notwendigen Lebensmittel gestiegen. Inwieweit allerdings die landwirtschaftlichen Maschinen zur Verbilligung der Lebensmittel beigetragen haben, lässt sich zahlenmässig nicht bestimmen. Wir können uns sehr wohl denken, dass die Intensität des Betriebes, die Anwendung der Maschinen, die Produktion so gesteigert haben, dass sie eine Verbilligung der Lebensmittel zur Folge hatten . . . . Wir denken dabei besonders an das klassische Land der Maschinenanwendung, an Amerika, welches noch vor wenigen Jahren der deutschen Getreideproduktion am gefährlichsten war. Wie hoch sind dort die Arbeitslöhne und wie billig ist das Getreide!" Bensing: *Einfluss der landwirtschaftlichen Maschinen*, S. 73.

<sup>2</sup> "The United States perhaps affords the highest example of a body of labor prepared and equipped to seek its best market wherever that market may be." Walker: "Wages," p. 180.

"L'Américain de pur sang a cela de commun avec le Tartare, qu'il est campé et non fixé sur le sol que ses pieds foulent." M. Chevalier: *Lettres sur l'Amérique du nord*, Tome I, p. 196.

transportation.<sup>1</sup> That the fluctuations are most marked in the "Pacific" and "Mountain" States, is largely due to the less perfect means of communication and transportation and to the further fact that farming operations in those regions are rather closely confined to the production of a very few different crops, upon the productiveness of which depends practically the whole of the demand for labor.<sup>2</sup>

THE INFLUENCE OF MACHINERY UPON THE LIFE AND  
GENERAL WELFARE OF THE INDEPENDENT FARM  
OPERATORS

Statistical data showing the changed condition of the independent farm operators, separate and apart from the dependent operators, are not at hand. It will be worth while, however, to note what showing can be deduced concerning the income of the independent farm operators from the average income per agricultural worker during the twenty-year period from 1880 to 1900.

The value of agricultural products, per capita of person ten years of age and over engaged in agriculture, as reported by the Tenth, Eleventh and Twelfth Censuses

<sup>1</sup> "The mobility of capital and labor depend upon two factors, (a) means of transport, (b) knowledge of markets. Both of these elements have been influenced by machinery." Nicholson: *Effects of Machinery on Wages*, p. 104.

<sup>2</sup> "The greatest irregularity of employment in the North, particularly in the Northwest, is found where the farmers are engaged in raising one or two staple crops to the neglect or exclusion of any wide system of diversified industry. . . . There was of that irregularity far more in the early days of the West than there is to-day, because the great central States of the North, where over half of our products are raised, are tending naturally and inevitably, though slowly, toward a diversity of crops that keep the men engaged on the farms for a greater relative proportion of the year; and thus irregularity of employment, owing to this change, is decreasing." L. G. Powers in *Rpt. of Ind. Com.* (1901), Vol. X, p. 172.

for the United States and for the several geographical divisions, was as follows :<sup>1</sup>

	1900	1890 <sup>2</sup>	1880
United States . . . . .	\$454.37 . . .	\$287.19 . . .	\$286.82
North Atlantic div. . . . .	620.20 . . .	380.47 . . .	420.41
South Atlantic div. . . . .	229.01 . . .	175.46 . . .	165.26
North Central div. . . . .	672.59 . . .	357.05 . . .	369.39
South Central div. . . . .	269.19 . . .	206.89 . . .	187.87
Western div. . . . .	723.72 . . .	433.95 . . .	506.25

Considering only the data for the United States, as a whole, we have found<sup>3</sup> that in 1879, 1890 and 1899, the average monthly wage of dependent farm workers was, respectively, \$10.43, \$12.45, and \$14.07, an increase of 34.9 per cent. in the twenty-year period. But the average value of agricultural products per farm worker for the years 1880, 1890, and 1900 was, respectively, \$286.82, \$287.19, and \$454.37, an increase of 58.4 per cent. for practically the same twenty-year period.<sup>4</sup>

It is self-evident that if the increase in the income of the dependent class alone is represented by 34.9 per cent., while the increase in the income of all agricultural workers—dependent and independent taken to-

<sup>1</sup> For data of value of products see Twelfth Census, Agriculture I, p. 703. For number of persons in agriculture, see p. 93 of this study.

<sup>2</sup> The low valuation reported by the Eleventh Census was not the result of a decreased production ; but rather, if it can be proper to use the term at any time, to an over-production. Take, for illustration, the case of corn : The corn crop produced in 1889 (the crop reported upon by the Eleventh Census), was so greatly in excess of the production in previous years that not only the price per bushel but the total value of the crop fell below that reported for any one of the nine preceding years. The same statement applies, more or less, to most of the staple farm crops for that year. See Dept. of Agr., Year Book (1901), pp. 699 *et seq.*

<sup>3</sup> See p. 65.

<sup>4</sup> Excluding the "Southern States," the corresponding showing for this twenty-year period is, for dependent workers, an increase of 31.7 per cent ; for all farm workers, 71.2 per cent.

gether—is represented by 58.4 per cent., then the increase in the income of the independent class alone could be indicated only by a much higher number. How much higher we cannot tell, probably not less than 75 or 80 per cent. For the period from 1850 to 1900 the rate should, doubtless, be more than doubled.

The independent farmer of the present day, who has hired workmen, does not find it needful to work always at the same laborious tasks he sets for his employees. At harvest time, it is not the hired man but the farmer himself who tends the machines and does the lighter work. Farm buildings are more substantial and supplied with more conveniences than they were fifty, or even twenty, years ago. Good roads abound, and, probably not less than one-fourth of the farmers now have the advantages of a free delivery of mail.<sup>1</sup> Telephone service between farm houses and connecting with the neighboring towns, or cities, is by no means uncommon. Railway and electric car lines run through the farming districts and where formerly there was a back-country farm house there is now, not infrequently, a suburban home. These advantages enable the modern farmer to keep well abreast of the times and to inform himself concerning measures and events nearly, if not quite as well, as the average resident of the towns.<sup>2</sup>

<sup>1</sup> The Superintendent of Free Delivery, in a letter dated January 27 1903, stated that on February 1, 1903, there would "be 13,108 rural routes in operation" and that each carrier "serves an average of 100 families."

<sup>2</sup> "The social and ethical sides of farm life are also making progress through the freer intercourse with the world, afforded by improved highways and by the extension of trolley lines. The contact of the younger generation with the life of the city is making new and more progressive methods of living almost a necessity. To-day, on many farms, the 'best room' is none too good for the family. Musical instruments are found in a large proportion of the country homes; a daily paper, some of the best magazines, and often the leading novel



It is rare indeed that the farmer of the present day cannot afford to send his children to school for at least six months of each school year during the greater portion of their school age. Our High Schools and Universities and especially our Agricultural Colleges which, twenty years ago, were hardly known, except on paper,<sup>1</sup> furnish ample evidence both of the greater interest of the farming classes in higher education and of their fitness for the higher lines of work.

Whether we look to the external signs of comfort and general welfare or to the character of the farm houses, there appears overwhelming evidence of a great change for the better with respect both to the dependent and independent classes,<sup>2</sup> the greater advantage appearing, however, to be in favor of the independent class.

To ascribe these improved conditions to the introduc-

of the day are not uncommon. . . . The attractiveness of our rural communities is growing. The movement of the population which has been so strongly toward the cities is now turning toward the country. Improved highways and the extension of trolley lines are bound to encourage this tendency. If formerly country people have sought homes in the cities, it is evident that the people of to-day are appreciating, as never before, that the country offers the strongest inducements for the building up of homes where health and the comforts of life can be enjoyed." Chas. S. Phelps: "Is there a Decadence of New England Agriculture," in *New Eng. Mag.*, Vol. 25, p. 382-3.

<sup>1</sup> Department of Agriculture, Year Book (1899), p. 173

<sup>2</sup> "But most have a false idea of farm life as it is to-day. The wife need not be the drudge she was once. Bearings have shifted, things are done differently, life runs smoother and better. More is accomplished with less wear of muscle and nerve. People work easier and do more, have greater leisure for recreation and self-culture. Much that the wife did formerly is provided for in other ways. . . . Advanced methods have made farming more profitable, easier indoors and out, have carried to the thinly settled country most of the refining influences and many of the advantages of city life." Clarence E. Blake: "Abandoned Farms as Homes for the Unemployed and City's Poor," in *New Eng. Mag.* (N. S.), Vol. 24, p. 582.

tion and use of machine power alone would, doubtless, be to overstate the truth, and yet, even waiving the impracticability of providing the requisite food supply by the earlier methods of culture, it is not at all clear that, under those earlier methods of heavy and exhaustive toil, men could be able effectively to interest themselves in affairs of government, social relations, and education in any degree comparable to that now common among the farming classes in this country.<sup>1</sup>

Consider how much lighter farm work now is than it was fifty years ago, before the introduction of machinery. How infinitely easier it must be to ride in the spring seat of a reaping machine, with no harder task at hand than that of keeping the horses out of the grain, than it would be to shuffle wearily along that same way, with bended back and with the perspiration springing from every pore, cutting an eight or ten foot cradle swath. And how much preferable to pitch sheaves to a threshing machine, or to work on the straw stack for a day or two than to labor all through the winter months flailing and winnowing grain.<sup>2</sup> It is much more delightful to have a sulky plow, with the option to walk or to ride, as inclination may direct, than to be compelled to trudge all day over the yielding soil, till your limbs grow heavy and you stumble at

<sup>1</sup> "The elimination of exhausting manual labor by the substitution of powerful machinery for puny arms has emancipated labor in our day from its hardest tasks, and has given to the worker both inclination and leisure for the development of his intellect in various ways that were impossible under former conditions." A. E. Outerbridge, Jr.: "Machinery and the Man," in *Scientific American Supp.*, Vol. 51, p. 21235.

<sup>2</sup> "Threshing was then, as it remained till our time, when it has been almost superseded by machinery, the chief farm-work of the winter." Rogers: *History of Agriculture and Prices*, Vol. I, p. 15.

evening when you strike the beaten pathway leading to your home.<sup>1</sup>

The ultimate and general effect of machinery upon farm laborers and, of course, upon all farm workers, has been quite thoroughly and pretty accurately summarized as follows: "As to the influence of machinery on farm labor, all intelligent expert observation declares it beneficial. It has relieved the laborer of much drudgery; made his work easier and his hours of service shorter; stimulated his mental faculties; given an equilibrium of effort to mind and body; and made the laborer a more efficient worker, a broader man, and a better citizen."<sup>2</sup>

The work of women on the farms has been much lightened by machine power; not so much, however, by machines with the aid of which a woman does the same work as formerly as by machines which have taken the work entirely from the farm,<sup>3</sup> as for example, spinning and weaving, soap-making,<sup>4</sup> and candle-making,<sup>5</sup> which were formerly well-accepted parts of women's work on the farm and generally, also, in the towns. At the present time, throughout probably the greater part of the country, cheese and butter making is ordinarily done away from the farm and, in some parts of the country, as, for instance, in North Dakota, even the

<sup>1</sup> "To follow the team in the furrow, day after day, is very tiresome work and has the effect of giving the boy a heavy awkward gait by stiffening the lower limbs—a condition from which he seldom if ever recovers." M. L. Dunlap: U. S. Agricultural Report (1863), p. 417.

<sup>2</sup> J. R. Dodge: "American Farm Labor," in Rept. of Ind. Com. (1901), Vol. XI, p. 111.

<sup>3</sup> McMaster: *History of the People of the United States*, Vol. I, p. 97.

<sup>4</sup> Smith: *Colonial Days and Ways*, pp. 69 and 115.

<sup>5</sup> Earle: *Home Life in Colonial Days*, p. 35.

coming of a threshing crew fails to add materially to the work of the women on the farm, for the crews bring a cook-wagon and provide their own meals.<sup>1</sup>

Of the machines used by women on the farm, that of the sewing machine is, doubtless, first in importance; the washing machine and the apple-paring machine are contrivances of no mean worth. For the rest, there may be found, instead of the andiron and crane, or the 'Dutch oven' and 'out oven' of pioneer times,<sup>2</sup> very conveniently arranged stoves and ranges; also egg-beaters and can-openers and a host of other articles of which the house-wife of fifty years ago knew nothing, not to mention incubators, milk separators, etc. The most of these things belong rather in the class of tools and utensils; nevertheless, they indicate the lighter character of the work which women have now to do on the farms than fell to the lot of women before the era of machine power made such conveniences possible.

#### THE INFLUENCE OF MACHINERY UPON THE PHYSICAL AND MENTAL NATURE OF MAN

It may be assumed that the occupation of a man goes far toward determining his physical and mental health.<sup>3</sup> This fact is indeed, as I understand it, the basis of much of the argument both for and against the use of machine power. So far as routine work is concerned I venture to say that the evil is not inherent in, nor peculiar to the use of machine power.

The primary purpose and usual effect of the use of

<sup>1</sup> Report of the Industrial Commission (1901), Vol. X, p. 851.

<sup>2</sup> McMaster: History of the People of the United States, Vol. V, p. 154.

<sup>3</sup> Farr: Vital Statistics, p. 394 *et seq.*

any machine, is the production of utilities at a less expenditure of time, energy, and money.<sup>1</sup> But this is only another way of saying that, when aided by machine power, a given expenditure of time, energy, and money will produce a greater quantity of utilities. Utilities are the means of satisfying wants; and the satisfaction of wants is essential to life and happiness. The use of machinery, by supplying wants, does therefore, one of two things; either it "enables a larger number of persons to get a living", or it enables a given number "to get a better living."<sup>2</sup> Anyone will, I think, admit that the utilities supplied by machine power have not all been consumed in better livings. A very great part of this additional means of satisfying wants has been devoted to the maintenance of a more numerous population. That this is true must be self-evident when we consider how greatly the supply of utilities has been increased by the use of machinery,<sup>3</sup> and how utterly impossible it would be for the labor force now in existence, unaided by machinery, to provide even the ordinary necessities of life as we now count necessities.<sup>4</sup>

<sup>1</sup> "Les outils ne sont que des machines simples et les machines ne sont que des outils compliqués que nous ajoutons à nos bras pour en augmenter la puissance; et les uns et les autres ne sont, à beaucoup d'égards, que des moyens d'obtenir le concours des agens naturels. Leur résultat est évidemment de donner moins de travail pour obtenir la même quantité d'utilité, ou, ce qui revient au même, d'obtenir plus d'utilité pour la même quantité de travail humain." J. B. Say, *Traité d'Economie Politique*, p. 85.

<sup>2</sup> Powers: *Labor Making Machinery*, p. 27.

<sup>3</sup> See pp. 22-23.

<sup>4</sup> "Selbst der Aermste hat in unserer Arbeitstheilung doch mehr zu genießen als wenn er im ungeselligen Zustand lebte: die bei uns am übelsten gestellt sind, Kränkliche ohne Vermögen, Familienväter mit allzu vielen Kindern, etc., würden im Urwalde einfach verhungern." Roscher: *Grundlagen der Nationalökonomie* (edition of 1900), p. 166.

By lightening the tasks of those who labor with their hands, and by increasing the quantity of the necessities of life which a given amount of labor can procure, machinery has not only favored a higher standard of living, but has increased the chances of attaining it.<sup>1</sup> Moreover, the use of machine power has made it possible for many now to devote themselves wholly to intellectual pursuits without involving either the enslavement or the degradation of others.<sup>2</sup>

Looking at the question from the standpoint of the whole social body, there can be no other conclusion than that the use of machinery, by increasing the supply of utilities and by making utilities more accessible,<sup>3</sup> has

<sup>1</sup> "To-day the world obtains commodities of excellent quality at prices which even the preceding generation would have deemed incredible . . . . The poor enjoy what the rich could not before afford. What were the luxuries have become the necessities of life. The laborer has more comforts than the farmer had a few generations ago. The farmer has more luxuries than the landlord had and is more richly clad and better housed. The landlord has books and pictures rarer, and appointments more artistic, than the king could then obtain." Carnegie : *The Gospel of Wealth*, p. 4.

<sup>2</sup> "If every instrument, at command, or from foreknowledge of its master's will, could accomplish its special work . . . . if the shuttle would weave, and the lyre play of itself; then neither would the architect want servants, nor the master slaves." Aristotle : "Politics" I, sec. 4 (Translation by Edward Walford.)

<sup>3</sup> "There is no fact in modern history more easily demonstrated than that the products of steam-driven machinery are mainly consumed by the common people—the masses." Gunton : *Principles of Social Economics*, p. 147.

"Quand je vous ai prouvé, messieurs, que l'introduction des machines expéditives, telles que le moulin à farine, ne diminue pas les moyens d'existence de la classes laborieuse, et n'a que l'inconvénient, assez grave à la vérité, de changer la nature de ses occupations, je n'ai pas complètement rendu justice aux machines. Le fait est que, dans la plupart des cas, elles sont favorables aux ouvriers mêmes dont elles semblaient supprimer le travail. Tout procédé expéditif, en réduisant les frais de production, met le produit à la portée d'un plus grande nombre de consommateurs. L'expérience prouve même que le nombre des consommateurs s'augmente dans une proportion bien plus rapide que la baisse du prix." J. B. Say : *Cours Complet d'Economie Politique*, Tome I, p. 193.

opened the way to a greater number, not only to live and to work,<sup>1</sup> but to develop themselves and to make the most of themselves which their inherent qualities may allow.

With reference to the workers themselves, we may safely say that men who have worked for years with machinery are on the average, quite as strong and healthy and at least as intelligent, as were men employed in the same industries before machine power was introduced. They certainly compare most favorably, too, with the average workman among those who now have little or nothing to do with machinery.

That routine work, which is persisted in and made one's principal occupation long after the worker has fully mastered it and developed his efficiency in that line to the limit of his capacity, tends to narrow the intellectual field of the worker and to depress his spirit, may be freely admitted. The human mind is continually opening to new wants and seeking the means

<sup>1</sup> "In der Behauptung, dass die Maschinen viele Arbeiter brotlos machen, liegt etwas Wahres aber noch mehr Irriges. In gewissen Fällen werden allerdings viele Arbeiter infolge einer neu eingeführten Maschine brotlos, aber ganz falsch ist die Ansicht, dass die Bevölkerung überhaupt durch Einführung des Maschinenwesens vermindert werde. Die Ausdehnung des Maschinengebrauches ist sogar eine der Hauptursachen der gestiegenen Bevölkerung gewesen, denn dadurch wurde die Erzeugung von Nahrungsmitteln, Kleidern und anderen Gütern so vermehrt, dass viel mehr Menschen erhalten werden können. Nicht bloss eine allgemeine Vermehrung der Bevölkerung hat in den vergangenen Jahrzehnten stattgefunden, sondern auch selbst in solchen Gewerben, in welchen die Maschinenanwendung zugenommen hat, ist die Zahl der Arbeiter oft weit grösser geworden." F. G. Schulze: *Nationalökonomie*, Leipzig, 1856, S. 44. Quoted by Franz Bensing in "Der Einfluss der landwirtschaftlichen Maschinen." S. 5.

of satisfying them.<sup>1</sup> In proportion, therefore, as the ambition of the individual worker and his capacity for accomplishing new and greater tasks, prompt him to advance in any line of activities, just so will he tend to become despondent and dissatisfied and wearied with too long continuance in any routine employment. Under such conditions the health of the strongest worker must eventually give way.

It is to be noticed, however, that a certain amount of routine is good for a person. No one ever acquires any high degree of skill or proficiency in any line of work until he has thoughtfully and systematically repeated its essential features over and over and made the doing of the task a habit,—to be done, when occasion demands, with little or no thought concerning the manner of the doing. The every day business of dressing ourselves, or of walking, would involve an enormous waste of time and patience if we were compelled to learn anew each day; and the still more common routine employment of carrying food to our mouths and of chewing it, always in the same old way, would become unbearable if routine were of itself a thing detrimental to the well-being of persons and always to be avoided.

It is to be noted also, that routine work is not confined to those employments which require the use of machine power. As a matter of fact, machines can be used to advantage only when the thing to be done by the machine is routine work. The tendency is,

<sup>1</sup>It is absurd to say that human beings can produce too much of everything needed for the satisfaction of human desire, since the satisfaction of one desire but awakens a new and wider desire, and there can be no end to the demands, the cravings, the yearnings of the being we call man." Henry George, Jr.: in *Chicago Record-Herald* of May 3, 1903.



therefore, always to give over to the machine,<sup>1</sup> the routine part of any work and to leave the more varied employment to the person in charge. The business of weaving, by the former hand method and by the present machine method, is a case in point.<sup>2</sup> Routine work is found quite as frequently in other occupations, as for example, in that of book-keeping, or of teaching music, or of repairing boots and shoes. It is accompanied, not infrequently, with heavy and exhaustive labor, as in the case of hod-carriers and of stone-masons. If we look to the business of many of our common laborers on the street, or on the railroads and canals, or at boat-wharves, we shall find many instances of routine employments such as the worst of machine-driven workmen, not only would not, but could not endure.

It is not so much the fact of routine or monotony of work as the far more serious fact of monotony of life which depresses and degrades the workman.<sup>3</sup> The

<sup>1</sup> "New machinery, when just invented, generally requires a great deal of care and attention. But the work of its attendant is always being sifted; that which is uniform and monotonous is gradually taken over by the machine, which thus becomes steadily more and more automatic and self-acting; till at last there is nothing for the hand to do, but to supply the material at certain intervals and to take away the work when finished." Marshall: *Principles of Economics* (3d ed.), Vol. I, p. 341.

<sup>2</sup> "Nothing could be more narrow or monotonous than the occupation of a weaver of plain stuffs in the old time. But now one woman will manage four or more looms, each of which does many times as much work in the course of the day as the old time hand-loom did and her work is much less monotonous and calls for much more judgment than his did." Marshall: *Principles of Economics*, (3d ed.), Vol. I, p. 342.

<sup>3</sup> "As Roscher says, it is monotony of life much more than monotony of work that is to be dreaded; monotony of work is an evil of the first order only when it involves monotony of life." Marshall: *Principles of Economics*, (3d ed.), Vol. I, p. 342.

boy, who is assigned lessons that are too hard for him, is disposed to quit his books, and he languishes if compelled to remain by them. On the other hand, if the tasks are suited to his capacity, and he masters them, he is usually proud of his achievements and anxious to do more; and if, instead of being assigned further work, he is required to do the same problems over and over again for, seemingly, no better object than that of being dutiful, he becomes dissatisfied and discouraged. In either case there is degradation and loss of power.

The grown up man is only an older boy. He delights to learn new things. He wants to be ever moving forward in the satisfaction of new wants; and if for any reason, as from the consciousness that the length of the working day or the intensity of his employment exacts too much for his strength or from a feeling that he is subject to some undue disadvantage, he finds that his natural powers are being over-taxed or that he cannot advance as rapidly as he thinks he should, he becomes dissatisfied and discouraged; and the longer he stays at his post, the less prepared he becomes to go into another employment. Hence arise the despair and abandon which leads to reckless living and, occasionally, to riot.

It is idle to say that the mere fact of working with a machine tends to narrow the intellectual capacity of the worker. As well might one say that it is injurious to a pupil to give attention to the more skillful work of his teacher.<sup>1</sup>

The mere fact of working with a machine and of being compelled to follow its orderly processes, tends

<sup>1</sup> "It is thought that educates,—the contact with quick and fertile minds; and it matters not whether this contact be produced by a voice or a book or a machine: the result is the same." Washington Gladden: *Working People and their Employers*, p. 20.

to develop in the mind of the operator, unless he be a perfect blockhead, a more or less perfect comprehension of the plan which was in the mind of the inventor. From having a conscious perception of the purpose of the inventor to noting defects in the means provided for the execution of it, is a step so easy and so obvious that it needs no discussion here. Every such conscious perception of an inventor's plan, or purpose, and every notation of defect in the means provided for its execution, involves a mental effort and a development of intellectual power just as certainly as, and, frequently, with far more beneficial results than, does the conjugation of a Greek verb or the reading of a page from the *Aeneid*. The operator of farm machinery is especially favored in this respect;<sup>1</sup> because, ordinarily he has charge of a complete machine and must understand it in order that he may keep it in repair.<sup>2</sup>

The simple fact that it requires the exercise of a certain degree of intelligence for the successful operation

<sup>1</sup> "Wer jemals eine landwirtschaftliche Maschine in ihrer Thätigkeit beobachtet und acht darauf gehabt hat, wie der Arbeiter sich drehen und wenden muss, wie er die grösste Aufmerksamkeit auf jede Bewegung der Maschine richten muss, wird zugeben, dass sie einen schädlichen Einfluss auf den geistlichen Zustand des Arbeiters nicht hat. Das Umgekehrte ist vielmehr der Fall. Die Arbeiter sind durch die Beschäftigung mit solchen Maschinen viel intelligenter und geschickter geworden, so dass es ihnen nicht nur möglich ist, in der Landwirtschaft einen guten Verdienst zu finden, sondern auch in anderen Gewerben. Ihre Erwerbsthätigkeit ist mit einem Wort durch die Maschinen eine bessere und höhere geworden, so dass ihnen jederzeit der Übergang von einem zum anderen Gewerbe ermöglicht ist. Das ist unstreitig ein Vorteil, den der landwirtschaftliche Arbeiter durch die Beschäftigung mit Maschinen vor dem industriellen voraus hat." —Bensing: *Der Einfluss der landwirtschaftlichen Maschinen*, S. 76.

<sup>2</sup> "On the whole the effect of the use of machinery has been to raise the intelligence and skill required on the part of those who use it, whether hired laborers or farm owners, and this is said to have resulted in improving the intellectual status of the American farmer." —Rept. of Ind. Com. (1901), Vol. X, p. xiv.

of a machine, together with the well known fact that machine workmen continue to command higher wages than other workmen engaged in the same industries, should be conclusive evidence that the use of a machine does not impair the intellect of the operator. Anyone may be presumed to know that it requires a higher grade of intellect to operate a steam-plow than it does to operate a hoe, and that the operator of the steam-plow commands the higher wage.

It is significant of the mutual relationship between the possession of intellectual power and the ability to operate machinery that, according to the returns of the Twelfth Census, the North Atlantic States, having 44.2 per cent of the total population of the country ten years of age and over engaged in manufactures, mechanic arts, trade, and transportation, reported only 15.8 per cent of the total number of illiterates, ten years of age and over, and only 27.9 per cent of the total number of deaths, occurring during the census year, from "injuries by machinery"; while the Southern States (South Atlantic and South Central divisions), having but 16.9 per cent of the total number, ten years of age and over, engaged in manufactures, mechanic arts, trade, and transportation, reported 66.9 per cent of the total number of illiterates, ten years of age and over, and 39.6 per cent of the total number of deaths from "injuries by machinery."<sup>1</sup>

It is safe to say that the people in the Southern States employ, relatively, even less of machinery in agri-

<sup>1</sup> For the number of persons engaged in manufactures, mechanic arts, trade and transportation, see page 93.

For statistics of illiteracy see Twelfth Census, Population II, p. C. The total number of deaths, reported as resulting from "injuries by machinery," was 333; of these 80 were reported from the North Atlantic States and 132 from the South Atlantic and South Central States.—Twelfth Census, Vital Statistics II, Table 7.

culture than they do in manufactures, mechanic arts, trade, and transportation. Accepting this as a fact, and bearing in mind the showing above made touching the matter of education and the personal injuries resulting from the use of machinery, it is not difficult to concur in the opinion of the English writer who held that "the expense of ignorance is the greatest in the obstructions which it presents to the introduction of machinery;" that "notwithstanding the progress of machinery in agriculture, there is probably as much sound practical labour-saving invention and machinery unused, as there is used; and that it is unused solely in consequence of the ignorance and incompetence of the work-people."<sup>1</sup>

#### THE USE OF MACHINERY AND THE LENGTH OF THE WORKING DAY

The length of the working-day is shorter now than formerly, This shorter working-day is, however, only very indirectly a consequence of the use of machinery. So far as the individual employer is concerned it would be quite correct to say that the shorter working-day is, not so much because of, as in spite of, his use of machinery.

Every employer of labor expects to further his own interests by giving employment to others. Of course it may happen, and doubtless does happen occasionally,

<sup>1</sup> Edwin Chadwick, Esq.: *Journal of the Statistical Society*, Vol. 25, p. 516.

"The less general use of improved machinery in the South than in other sections is cited in partial explanation of the slow rate of agricultural progress in that country and is itself explained by the lack of mechanical skill on the part of the negroes and by the cheapness of labor, which makes it more economical to employ hand labor in many operations which would be more cheaply done by machinery where labor is more expensive."—Rept. of Ind. Com. (1901), Vol. X, p. xiv.

that men offer employment for the sake of the employee, but wages paid for such employment are really charity offerings in disguise. They have no part in a discussion concerning the usual and every-day relations between employers and employees.

In like manner we may say that every employee expects, in return for any service which he renders, to receive a certain payment which shall yield him a net return of satisfaction above sacrifice. Not only does he expect a net return, but he expects a higher net return of satisfaction above sacrifice than he could otherwise secure. In other words, he expects that it will be better or more profitable, for him to undertake the employment offered, on the terms proposed, than to decline it and, perhaps continue unemployed. Unless the workman has such an expectation, he should not undertake the work. It is not only proper,<sup>1</sup> but most desirable that both the employer and the employee should have their expectations realized.

What is the attitude of the parties with respect to each other? Assuming a certain length of working day, the position of the machine-using employer has been well stated by an English factory inspector as follows: "The quantity produced must, in the main, be regulated by the speed of the machinery; it must be the interest of the mill owner to drive it at the utmost rate of speed consistent with these following conditions, viz., the preservation of the machinery from too rapid deterioration; the preservation of the quality of the article manufactured; and the capability of the workman to follow the motion without a greater exertion

<sup>1</sup> "In an ordinary contract both parties may, and usually do, gain by entering into the agreement." *Amer. and Eng. Enc. of Law*, (2d ed.), Vol. XIV, p. 582.

than he can sustain for a constancy."<sup>1</sup> In short, it is the interest and purpose of the employer to so manage his establishment that he may secure from it the highest net return. He is producing for a market, and the more promptly he can supply the demands of that market the greater are his chances of making a profit; and hence the need for "the utmost rate of speed," and also for the most constant operation of the factors of production consistent with the conditions named. "The highest result with the least expenditure of means,"<sup>2</sup> is the motto of the employer.

One factor, the machine, can work almost continuously day and night; and its efficiency is the same for the twenty-fourth hour as for the first hour or for any intermediate hour. Indeed, except as occasional stops may be requisite in order that the machine be kept in repair, the more continuously it is kept at work the less likely it is to deteriorate and the less likely that it will become worthless by reason of the invention of a better machine. Whether we consider the work of a machine for a day, for a year, or for its whole life-time as a producing agent, it is most effective and yields the highest net return to its owner when operated almost continuously.

The other factor, the workman, cannot work continuously for any great length of time. There must be portions of each day given to rest and recuperation; and the efficiency of the workman in the last hour of a long working-day is much less than in any other hour, unless, perhaps, in the first. In the average employment requiring the use of little or no machinery, we may assume that the first hour's work of each work-

<sup>1</sup> See Karl Marx : *Capital*, p. 413.

<sup>2</sup> Brooks : *The Social Unrest*, p. 201.

ing day is worth less than that of the second, or of the third, etc. But after the sixth or seventh hour the workman becomes increasingly less efficient. Moreover, if he works beyond his strength in any one day, and still more, if he works beyond his strength for any considerable length of time, he loses vitality; and loss of vitality, whatever may be the determining cause, means, inevitably, the degradation of the workman and a permanently decreased efficiency.<sup>1</sup>

The employer who is seeking the highest net return from an investment in labor should, therefore, if he is wise, be guided by a very different rule, in fixing the working-day for a man, from that which he should follow in fixing the length of the working-day for a machine.

If the term of employment is for a day only, and fresh workmen can be secured for each succeeding day, it may pay the employer to crowd his employees, to the utmost limit of their strength throughout, perhaps, the full twenty-four hours of the day. But if the term of employment is for a year, or for life, with no chance of getting a substitute, then it will, ordinarily,<sup>2</sup> pay an employer to be more saving of his employees' vitality. He must now look to the preservation of the health and strength of his employees for the longer period of employment. It is only in this way that the employer can secure the highest net return on his investment. We know, however, that employers are sometimes both

<sup>1</sup> Walker: *Wages*, pp. 81-88.

<sup>2</sup> "Slave-labour, under an intelligent profit monger, may require provision to be made for a full working life, though even in slavery it may sometimes pay to use up a slave by intense toil during a shorter period." John A. Hobson: *The Economics of Distribution*, p. 162.



unwise<sup>1</sup> and unscrupulous<sup>2</sup> and that even in cases of employment for long periods, employers will, not infrequently, discount the future at too high a rate and overwork their employees. The temptation to do this way is especially strong when free laborers are employed because the services of a freeman are not ordinarily paid for in advance and for the whole period of possible employment, as in the purchase of a slave, but day by day, or month by month, and the death or total disability of the freeman relieves the employer from paying for the latter portion of the stipulated term, that is for that portion of the term when the overworked laborer is least efficient. Moreover, except as provided for by the employer's liability acts, the employer of free labor has no financial interest in the welfare of a workman after the stipulated period of service is in any way terminated.

<sup>1</sup> "I challenge the assumption which underlies the orthodox doctrine of wages, namely, the sufficiency of the sense of self interest. Mankind, always less wise, and too often foolish to the point of stupidity, on the one side, and of fanaticism, on the other, whether in government, in domestic life, in the care of their bodies, or in the care of their souls, do not suddenly become wise in industrial concerns. The argument for keeping a laborer well applies with equal force to the maintenance of a slave." Francis A. Walker: *Wages*, p. 58.

"It shocks us to-day to hear the allegation that slaveowners once discussed in convention the expediency of using a slave up in six years or four years in a certain occupation, and decided that it 'paid' to use him up in four." Ely: *Outlines of Economics*, p. 182.

<sup>2</sup> "Certainly, it seldom happens that any one in the position of a monopolist with respect to the purchase of labor power will look ahead for years and ask, Is not the course I am pursuing likely to diminish the labor supply? We do not find any action on the part of the purchaser of labor power which would indicate that this is the case. Take the example of the sweater and his victims. We do not find that he is held back from exercising his full power over them by the fear that he will cut off the future supply of labor power. He thinks that it will be forthcoming from some source; but even if not, he thinks, before the supply dries up I will reap my harvest; I will make my fortune." Ely: *Monopolies and Trusts*, p. 132.

Ambitious men will even overwork themselves. It is too much to expect that they should, voluntarily, be more solicitous for the welfare of their employees.

We have now to inquire concerning the effect of yoking together the machine and labor factors,—the one yielding the highest net return, when worked almost incessantly, either for short or for long terms of employment; the other yielding the highest net return when worked for longer or shorter periods, according to the length of the term of employment, but always, unless in the case of employment for a single day, when considerable portions of each day are allowed for rest and recuperation. It is like harnessing together a racer and a plow horse. From the standpoint of the employer, the machine and labor factors do not work in harmony. Under any conditions the employer is interested in getting as much service as possible from his employee and, when using machinery, is constantly impelled, according to the amount of his investment in the machine factor<sup>1</sup> to spur on the labor factor to a longer working day.

The position of the employee is radically different from that of the employer. When making a contract for the sale of his labor power, the employee does not seek to establish a long working day. He wants a certain amount of exercise, and he may even be glad to do some work for the pleasure which comes of achievement, but a long working day, or a day of intense or otherwise exhaustive toil, is not desired. Not infre-

<sup>1</sup> "As machinery became more and more costly, the length of the working-day was lengthened until it became, even for women and children, sixteen and eighteen hours in cases not rare. Indeed, it has been generally longer where women and children have been the predominating labor force, because they are less powerful to resist oppression."—Ely: *Labor Movement in America*, p. 109.

quently, the employee assumes a position antagonistic to the interests of his employer. There remains, therefore, a wide margin within which the interests of employers and employees are adverse to each other; and the immediate effect of the introduction of machinery is rather to widen that area than to narrow it.

It would doubtless be impossible to enumerate all of the causes which have operated to give a shorter working day in the more recent years. Public opinion has doubtless had some influence in this direction; but, for the most part, the various causes have found expression in, and have operated through, factory and labor laws.

Just how far the legislation thus far enacted in behalf of employees has operated to give farm laborers a shorter working day it would, doubtless, be impossible to say. That the farm laborers have, in some degree, profited by such legislation may be fairly inferred from the testimony presented before the recent Industrial Commission and summarized in the report of that Commission as follows: "Returns relative to the hours of daily service show the influence of general labor agitation for shorter hours in shortening the day of rural service. The reduction is very general, and greater where industrial and mechanical enterprise is dominant."<sup>1</sup>

It is to be expected, however, that the working-day should be longer on the farms than in the factories, for the outdoor life and more varied nature of the employment promotes health and makes it possible for farm workmen to continue their work through a given period with, relatively, much less cost of vitality.

That this is true will appear fairly evident from a

<sup>1</sup> Report of Industrial Commission (1901), Vol. XI, p. 82.

consideration of the following table taken from Dr. Amos G. Warner's work on "American Charities."<sup>1</sup>

NUMBER LIVING AT STATED AGES OUT OF 1,000 LIVING AT AGE OF 25.

	<i>Ages</i>			
	35	45	55	60
Farmer <sup>2</sup> . . . . .	898.5	821.19	730.06	639.54
Shoemaker . . . . .	908.8	812.45	690.65	591.64
Weaver . . . . .	920.3	822.78	696.04	581.20
Grocer . . . . .	923.7	826.68	696.02	617.38
Blacksmith . . . . .	918.8	804.84	672.02	547.02
Carpenter . . . . .	905.5	812.18	676.58	576.38
Tailor . . . . .	883.7	758.17	631.58	544.10
Laborer . . . . .	902.1	789.35	652.85	557.51
Miner . . . . .	915.1	810.79	646.97	535.69
Baker . . . . .	924.1	787.35	620.51	518.04
Butcher . . . . .	887.0	740.64	569.47	451.41
Innkeeper . . . . .	861.7	684.99	491.13	395.38

As a matter of fact, the length of the working day, the conditions under which work shall be done, and the wages to be paid in any industry, are questions which must all, ultimately, be determined by economic law<sup>3</sup> and, to a very large extent, independently for each

<sup>1</sup> Warner : *American Charities*, p. 107.

<sup>2</sup> "The farmers and agricultural laborers are at present among the healthiest classes of the population classified according to occupation. The young farmer for some reason or other suffers a higher mortality than the labourer; but at 35 and upward the British farmer enjoys comforts which are beyond the reach of the labourers."—Farr : *Vital Statistics*, p. 403.

<sup>3</sup> "If men can produce as much or nearly as much in eight hours as they can in ten, eight hours is destined to become the working day; otherwise not. The owner of a stoneyard in Chicago has stated that his men could do as much work in eight hours as in ten hours. Their work is fatiguing and little or nothing is gained by working the men over eight hours. Eight hours was the day's labor in that yard, and the owner said so far as his business was concerned the eight-hour question had solved itself."—Powers : *Labor Making Machinery*, p. 33.

industry according to the nature of the work to be done and according to the character of the workers. But the economic law by which they are to be determined is not necessarily the economic law which is most favorable to employers, or to employees, nor even to the interest of employers and employees jointly considered, any more than the policy of our federal government is to be determined by the civil law most favorable to any particular state or section of the Union. Such questions are to be determined by that economic law which is most favorable to the whole social body,—to the state,—to humanity.<sup>1</sup>

<sup>1</sup>“Ausgangspunkt, wie Zielpunkt unserer Wissenschaft ist der Mensch”—Roëcher: *Grundlagen der Nationalökonomie*, S. 1.

[NOTE.—The tables which follow, and upon which the calculations in this study are based, will be found to differ in some particulars from the corresponding tables in the Twelfth Census special report on occupations. The foot-notes connected with the several tables show the sources upon which I relied in making them. Further than this I need add only that my tables were completed early in 1903—over a year before the publication of the census report referred to —H. W. Q.]

**TOTAL NUMBER OF PERSONS, TEN YEARS OF AGE AND OVER, IN THE SEVERAL OCCUPATION CLASSES IN 1870, 1880, 1890, AND 1900—CLASSIFICATION OF THE TWELFTH CENSUS<sup>1</sup>**

	<i>Agriculture</i>	<i>Prof. Services</i>	<i>Dom. and Pers.</i>	<i>Trade and Trans.</i>	<i>Mfg. and Mech. Arts</i>
<b>UNITED STATES</b>					
1900 .	10,381,765 . .	1,258,739 . .	5,580,657 . .	4,766,964 . .	7,085,992
1890 .	8,565,926 . .	944,333 . .	4,220,812 . .	3,326,122 . .	5,678,468
1880 .	7,713,875 . .	603,202 . .	3,423,815 . .	1,866,481 . .	3,784,726
1870 .	5,948,561 . .	371,098 . .	2,277,587 . .	1,228,823 . .	2,679,854
<b>NORTH ATLANTIC DIVISION</b>					
1900 .	1,074,412 . .	411,279 . .	1,857,069 . .	1,867,805 . .	3,368,710
1890 .	1,099,465 . .	299,468 . .	1,467,628 . .	1,316,779 . .	2,788,120
1880 .	1,048,442 . .	207,551 . .	1,211,958 . .	828,802 . .	2,012,969
1870 .	1,020,440 . .	139,809 . .	878,064 . .	584,672 . .	1,483,608
<b>SOUTH ATLANTIC DIVISION</b>					
1900 .	2,032,569 . .	119,360 . .	798,837 . .	422,272 . .	627,653
1890 .	1,669,014 . .	92,361 . .	581,127 . .	308,751 . .	466,803
1880 .	1,622,081 . .	62,309 . .	517,429 . .	177,436 . .	298,507
1870 .	1,272,873 . .	39,778 . .	349,164 . .	118,217 . .	215,740
<b>NORTH CENTRAL DIVISION</b>					
1900 .	3,508,808 . .	478,237 . .	1,759,936 . .	1,671,015 . .	2,162,917
1890 .	3,117,043 . .	371,347 . .	1,328,853 . .	1,151,139 . .	1,705,456
1880 .	2,735,525 . .	230,622 . .	1,025,089 . .	595,791 . .	1,038,096
1870 .	2,043,984 . .	131,821 . .	652,225 . .	363,638 . .	703,642
<b>SOUTH CENTRAL DIVISION</b>					
1900 .	3,300,817 . .	152,381 . .	793,549 . .	475,931 . .	487,077
1890 .	2,321,694 . .	114,263 . .	524,165 . .	315,318 . .	360,374
1880 .	2,120,525 . .	73,455 . .	464,909 . .	161,449 . .	201,835
1870 .	1,499,316 . .	46,751 . .	293,287 . .	111,347 . .	145,514
<b>WESTERN DIVISION</b>					
1900 .	465,159 . .	97,482 . .	371,266 . .	329,941 . .	439,635
1890 .	358,710 . .	66,894 . .	319,039 . .	234,135 . .	357,715
1880 .	187,302 . .	29,265 . .	204,430 . .	103,003 . .	233,319
1870 .	111,948 . .	12,939 . .	104,847 . .	50,949 . .	131,350

<sup>1</sup> The data for the years 1890 and 1900 are taken from the Report of the Twelfth Census, Population II, pp. cxxxv-cxxxvi.

The data for the years 1870 and 1880 are derived from the Report of the Eleventh Census, Population II, pp. cix-cx. Corrections being made as indicated in the Report of the Twelfth Census, Population II, p. cxxvii. The correction is complete except in the case of "Officials of Mining and Quarrying Companies" for the year 1880. These were not separately reported in that year and hence correction was impossible as to them.

**TOTAL NUMBER OF MALES, TEN YEARS OF AGE AND  
OVER, IN THE SEVERAL OCCUPATION CLASSES, IN  
1870, 1880, 1890, AND 1900—CLASSIFICATION OF TWELFTH  
CENSUS<sup>1</sup>**

	<i>Agricul- ture</i>	<i>Prof. Ser- vices</i>	<i>Dom. and Pers.</i>	<i>Trade and Trans.</i>	<i>Mfg. and Mech. Arts</i>
<b>UNITED STATES</b>					
1900 .	9,404,429 . .	828,163 . .	3,485,208 . .	4,263,617 . .	5,772,788
1890 .	7,887,042 . .	632,646 . .	2,553,161 . .	3,097,701 . .	4,650,540
1880 .	7,119,365 . .	425,947 . .	2,242,309 . .	1,803,629 . .	3,153,692
1870 .	5,551,593 . .	278,841 . .	1,304,430 . .	1,208,995 . .	2,325,776
<b>NORTH ATLANTIC DIVISION</b>					
1900 .	1,039,729 . .	270,254 . .	1,165,352 . .	1,629,782 . .	2,629,848
1890 .	1,078,791 . .	192,797 . .	890,856 . .	1,201,302 . .	2,179,295
1880 .	1,043,497 . .	136,572 . .	774,767 . .	790,344 . .	1,587,867
1870 .	1,017,751 . .	95,853 . .	514,160 . .	571,106 . .	1,221,885
<b>SOUTH ATLANTIC DIVISION</b>					
1900 .	1,697,623 . .	81,949 . .	418,784 . .	389,390 . .	505,345
1890 .	1,421,695 . .	66,791 . .	271,493 . .	291,228 . .	380,580
1880 .	1,358,072 . .	49,168 . .	289,342 . .	170,702 . .	252,208
1870 .	1,088,122 . .	33,572 . .	156,037 . .	115,394 . .	189,468
<b>NORTH CENTRAL DIVISION</b>					
1900 .	3,408,789 . .	299,297 . .	1,162,678 . .	1,489,968 . .	1,822,671
1890 .	3,036,880 . .	236,730 . .	854,956 . .	1,076,163 . .	1,456,420
1880 .	2,720,123 . .	156,419 . .	714,686 . .	582,458 . .	914,347
1870 .	2,037,688 . .	97,011 . .	402,982 . .	361,354 . .	654,120
<b>SOUTH CENTRAL DIVISION</b>					
1900 .	2,808,511 . .	109,401 . .	452,563 . .	450,308 . .	417,151
1890 .	1,997,805 . .	86,914 . .	277,033 . .	304,360 . .	306,933
1880 .	1,811,486 . .	61,011 . .	283,271 . .	158,314 . .	178,177
1870 .	1,296,652 . .	41,231 . .	140,623 . .	110,372 . .	132,846
<b>WESTERN DIVISION</b>					
1900 .	449,777 . .	67,262 . .	285,831 . .	304,169 . .	397,773
1890 .	351,871 . .	49,414 . .	258,823 . .	224,648 . .	327,312
1880 .	186,187 . .	22,777 . .	180,243 . .	101,811 . .	221,093
1870 .	111,380 . .	11,174 . .	90,628 . .	50,769 . .	127,457

<sup>1</sup> See footnote, page 93.

**TOTAL NUMBER OF FEMALES, TEN YEARS OF AGE AND  
OVER, IN THE SEVERAL OCCUPATION CLASSES IN  
1870, 1880, 1890, AND 1900—CLASSIFICATION OF THE  
TWELFTH CENSUS<sup>1</sup>**

	<i>Agricul- ture</i>	<i>Prof. Ser- vices</i>	<i>Dom. and Pers.</i>	<i>Trade and Trans.</i>	<i>Mfg. and Mech. Arts</i>
<b>UNITED STATES</b>					
1900 .	977,336 . .	430,576 . .	2,095,449 . .	503,347 . .	1,313,204
1890 .	678,884 . .	311,687 . .	1,667,651 . .	228,421 . .	1,027,928
1880 .	594,510 . .	177,255 . .	1,181,506 . .	62,852 . .	631,034
1870 .	396,968 . .	92,257 . .	973,157 . .	19,828 . .	354,078
<b>NORTH ATLANTIC DIVISION</b>					
1900 .	34,683 . .	141,025 . .	691,717 . .	238,023 . .	738,862
1890 .	20,674 . .	106,671 . .	576,772 . .	115,477 . .	608,825
1880 .	4,945 . .	70,979 . .	437,191 . .	38,458 . .	425,102
1870 .	2,689 . .	43,956 . .	363,904 . .	13,566 . .	261,723
<b>SOUTH ATLANTIC DIVISION</b>					
1900 .	334,946 . .	37,411 . .	380,053 . .	32,882 . .	122,308
1890 .	247,319 . .	25,570 . .	309,634 . .	17,523 . .	86,223
1880 .	264,009 . .	13,141 . .	228,087 . .	6,734 . .	46,299
1870 .	184,751 . .	6,206 . .	193,127 . .	2,823 . .	26,272
<b>NORTH CENTRAL DIVISION</b>					
1900 .	100,019 . .	178,940 . .	597,258 . .	181,047 . .	340,246
1890 .	80,163 . .	134,617 . .	473,897 . .	74,976 . .	249,036
1880 .	15,402 . .	74,203 . .	310,403 . .	13,333 . .	123,749
1870 .	6,296 . .	34,810 . .	249,243 . .	2,284 . .	49,522
<b>SOUTH CENTRAL DIVISION</b>					
1900 .	492,306 . .	42,980 . .	340,986 . .	25,623 . .	69,926
1890 .	323,889 . .	27,349 . .	247,132 . .	10,958 . .	53,441
1880 .	309,039 . .	12,444 . .	181,638 . .	3,135 . .	23,658
1870 .	202,664 . .	5,520 . .	152,664 . .	975 . .	12,668
<b>WESTERN DIVISION</b>					
1900 .	15,382 . .	30,220 . .	85,435 . .	25,772 . .	41,862
1890 .	6,839 . .	17,480 . .	60,216 . .	9,487 . .	30,403
1880 .	1,115 . .	6,488 . .	24,187 . .	1,192 . .	12,226
1870 .	568 . .	1,765 . .	14,219 . .	180 . .	3,893

<sup>1</sup> See footnote, page 93.



PER CENT OF PERSONS IN THE SEVERAL OCCUPATION CLASSES OF THE TOTAL NUMBER IN OCCUPATION CLASSES, IN 1870, 1880, 1890, AND 1900.—(CLASSIFICATION OF 1900).<sup>1</sup>

	<i>Agriculture</i>	<i>Prof. Services</i>	<i>Dom. and Pers.</i>	<i>Trade and Trans.</i>	<i>Mfg. and Mech. Arts</i>
<b>UNITED STATES</b>					
1900 . . . . .	35.7 . . . . .	4.3 . . . . .	19.2 . . . . .	16.4 . . . . .	24.4
1890 . . . . .	37.7 . . . . .	4.1 . . . . .	18.6 . . . . .	14.6 . . . . .	25.0
1880 . . . . .	44.3 . . . . .	3.5 . . . . .	19.7 . . . . .	10.7 . . . . .	21.8
1870 . . . . .	47.6 . . . . .	3.0 . . . . .	18.2 . . . . .	9.8 . . . . .	21.4
<b>NORTH ATLANTIC DIVISION</b>					
1900 . . . . .	12.5 . . . . .	4.8 . . . . .	21.6 . . . . .	21.8 . . . . .	39.3
1890 . . . . .	15.8 . . . . .	4.3 . . . . .	21.0 . . . . .	18.9 . . . . .	40.0
1880 . . . . .	19.8 . . . . .	3.9 . . . . .	22.8 . . . . .	15.6 . . . . .	37.9
1870 . . . . .	24.9 . . . . .	3.4 . . . . .	21.4 . . . . .	14.2 . . . . .	36.1
<b>SOUTH ATLANTIC DIVISION</b>					
1900 . . . . .	50.8 . . . . .	3.0 . . . . .	20.0 . . . . .	10.5 . . . . .	15.7
1890 . . . . .	53.5 . . . . .	3.0 . . . . .	18.6 . . . . .	9.9 . . . . .	15.0
1880 . . . . .	60.6 . . . . .	2.3 . . . . .	19.3 . . . . .	6.6 . . . . .	11.2
1870 . . . . .	63.8 . . . . .	2.0 . . . . .	17.5 . . . . .	5.9 . . . . .	10.8
<b>NORTH CENTRAL DIVISION</b>					
1900 . . . . .	36.6 . . . . .	5.0 . . . . .	18.4 . . . . .	17.4 . . . . .	22.6
1890 . . . . .	40.6 . . . . .	4.9 . . . . .	17.3 . . . . .	15.0 . . . . .	22.2
1880 . . . . .	48.6 . . . . .	4.1 . . . . .	18.2 . . . . .	10.6 . . . . .	18.5
1870 . . . . .	52.5 . . . . .	3.4 . . . . .	16.7 . . . . .	9.3 . . . . .	18.1
<b>SOUTH CENTRAL DIVISION</b>					
1900 . . . . .	63.4 . . . . .	2.9 . . . . .	15.2 . . . . .	9.1 . . . . .	9.4
1890 . . . . .	63.9 . . . . .	3.1 . . . . .	14.4 . . . . .	8.7 . . . . .	9.9
1880 . . . . .	70.2 . . . . .	2.4 . . . . .	15.4 . . . . .	5.3 . . . . .	6.7
1870 . . . . .	71.5 . . . . .	2.2 . . . . .	14.0 . . . . .	5.3 . . . . .	7.0
<b>WESTERN DIVISION</b>					
1900 . . . . .	27.3 . . . . .	5.7 . . . . .	21.8 . . . . .	19.4 . . . . .	25.8
1890 . . . . .	26.8 . . . . .	5.0 . . . . .	23.9 . . . . .	17.5 . . . . .	26.8
1880 . . . . .	24.7 . . . . .	3.9 . . . . .	27.0 . . . . .	13.6 . . . . .	30.8
1870 . . . . .	27.2 . . . . .	3.1 . . . . .	25.4 . . . . .	12.4 . . . . .	31.9

<sup>1</sup> See footnote, p. 93.

PER CENT OF MALES IN THE SEVERAL OCCUPATION  
CLASSES OF THE TOTAL NUMBER OF MALES IN  
OCCUPATION CLASSES IN 1870, 1880, 1890 AND 1900.—  
(CLASSIFICATION OF 1900).<sup>1</sup>

	<i>Agricul- ture</i>	<i>Prof. Ser- vices</i>	<i>Dom. and Pers.</i>	<i>Trade and Trans.</i>	<i>Mfg. and Mech. Arts</i>
<b>UNITED STATES</b>					
1900 . . . . .	39.6 . . . . .	3.5 . . . . .	14.7 . . . . .	17.9 . . . . .	24.3
1890 . . . . .	41.9 . . . . .	3.4 . . . . .	13.6 . . . . .	16.4 . . . . .	24.7
1880 . . . . .	48.3 . . . . .	2.9 . . . . .	15.2 . . . . .	12.2 . . . . .	21.4
1870 . . . . .	52.1 . . . . .	2.6 . . . . .	12.2 . . . . .	11.3 . . . . .	21.8
<b>NORTH ATLANTIC DIVISION</b>					
1900 . . . . .	15.4 . . . . .	4.0 . . . . .	17.3 . . . . .	24.2 . . . . .	39.1
1890 . . . . .	19.4 . . . . .	3.5 . . . . .	16.1 . . . . .	21.7 . . . . .	39.3
1880 . . . . .	24.1 . . . . .	3.2 . . . . .	17.9 . . . . .	18.2 . . . . .	36.6
1870 . . . . .	29.8 . . . . .	2.8 . . . . .	15.0 . . . . .	16.7 . . . . .	35.7
<b>SOUTH ATLANTIC DIVISION</b>					
1900 . . . . .	54.9 . . . . .	2.7 . . . . .	13.5 . . . . .	12.6 . . . . .	16.3
1890 . . . . .	58.5 . . . . .	2.7 . . . . .	11.2 . . . . .	12.0 . . . . .	15.6
1880 . . . . .	64.7 . . . . .	2.3 . . . . .	13.6 . . . . .	8.0 . . . . .	11.9
1870 . . . . .	68.7 . . . . .	2.1 . . . . .	9.9 . . . . .	7.3 . . . . .	12.0
<b>NORTH CENTRAL DIVISION</b>					
1900 . . . . .	41.7 . . . . .	3.7 . . . . .	14.2 . . . . .	18.2 . . . . .	22.2
1890 . . . . .	45.6 . . . . .	3.5 . . . . .	12.8 . . . . .	16.2 . . . . .	21.9
1880 . . . . .	53.5 . . . . .	3.1 . . . . .	14.0 . . . . .	11.4 . . . . .	18.0
1870 . . . . .	57.4 . . . . .	2.7 . . . . .	11.3 . . . . .	10.2 . . . . .	18.4
<b>SOUTH CENTRAL DIVISION</b>					
1900 . . . . .	66.3 . . . . .	2.6 . . . . .	10.7 . . . . .	10.6 . . . . .	9.8
1890 . . . . .	67.2 . . . . .	2.9 . . . . .	9.3 . . . . .	10.3 . . . . .	10.3
1880 . . . . .	72.7 . . . . .	2.4 . . . . .	11.4 . . . . .	6.4 . . . . .	7.1
1870 . . . . .	75.3 . . . . .	2.4 . . . . .	8.2 . . . . .	6.4 . . . . .	7.7
<b>WESTERN DIVISION</b>					
1900 . . . . .	29.9 . . . . .	4.5 . . . . .	19.0 . . . . .	20.2 . . . . .	26.4
1890 . . . . .	29.0 . . . . .	4.1 . . . . .	21.4 . . . . .	18.5 . . . . .	27.0
1880 . . . . .	26.1 . . . . .	3.2 . . . . .	25.3 . . . . .	14.3 . . . . .	31.1
1870 . . . . .	28.5 . . . . .	2.8 . . . . .	23.1 . . . . .	13.0 . . . . .	32.6

<sup>1</sup> See footnote, p. 93.

PER CENT OF FEMALES IN THE SEVERAL OCCUPATION  
CLASSES OF THE TOTAL NUMBER OF FEMALES IN  
OCCUPATION CLASSES IN 1870, 1880, 1890, AND 1900  
(CLASSIFICATION OF 1900).<sup>1</sup>

	<i>Agricul- ture</i>	<i>Prof. Ser- vices</i>	<i>Dom. and Pers.</i>	<i>Trade and Trans.</i>	<i>Mfg. and Mech. Arts</i>
<b>UNITED STATES</b>					
1900 . .	18.4 . . .	8.1 . . .	39.4 . . .	9.4 . . .	24.7
1890 . .	17.3 . . .	8.0 . . .	42.6 . . .	5.8 . . .	26.3
1880 . .	22.5 . . .	6.7 . . .	44.6 . . .	2.4 . . .	23.8
1870 . .	21.6 . . .	5.0 . . .	53.0 . . .	1.1 . . .	19.3
<b>NORTH ATLANTIC DIVISION</b>					
1900 . .	1.9 . . .	7.6 . . .	37.5 . . .	12.9 . . .	40.1
1890 . .	1.4 . . .	7.5 . . .	40.4 . . .	8.1 . . .	42.6
1880 . .	0.5 . . .	7.3 . . .	44.8 . . .	3.9 . . .	43.5
1870 . .	0.4 . . .	6.4 . . .	53.0 . . .	2.0 . . .	38.2
<b>SOUTH ATLANTIC DIVISION</b>					
1900 . .	36.9 . . .	4.1 . . .	41.9 . . .	3.6 . . .	13.5
1890 . .	36.0 . . .	3.7 . . .	45.1 . . .	2.6 . . .	12.6
1880 . .	47.3 . . .	2.3 . . .	40.9 . . .	1.2 . . .	8.3
1870 . .	44.7 . . .	1.5 . . .	46.7 . . .	0.7 . . .	6.4
<b>NORTH CENTRAL DIVISION</b>					
1900 . .	7.2 . . .	12.8 . . .	42.7 . . .	13.0 . . .	24.3
1890 . .	7.9 . . .	13.3 . . .	46.8 . . .	7.4 . . .	24.6
1880 . .	2.9 . . .	13.8 . . .	57.8 . . .	2.5 . . .	23.0
1870 . .	1.8 . . .	10.2 . . .	72.8 . . .	0.7 . . .	14.5
<b>SOUTH CENTRAL DIVISION</b>					
1900 . .	50.7 . . .	4.4 . . .	35.1 . . .	2.6 . . .	7.2
1890 . .	48.9 . . .	4.1 . . .	37.3 . . .	1.6 . . .	8.1
1880 . .	58.3 . . .	2.3 . . .	34.3 . . .	0.6 . . .	4.5
1870 . .	54.1 . . .	1.5 . . .	40.8 . . .	0.2 . . .	3.4
<b>WESTERN DIVISION</b>					
1900 . .	7.7 . . .	15.2 . . .	43.0 . . .	13.0 . . .	21.1
1890 . .	5.5 . . .	14.1 . . .	48.4 . . .	7.6 . . .	24.4
1880 . .	2.5 . . .	14.4 . . .	53.5 . . .	2.6 . . .	27.0
1870 . .	2.7 . . .	8.5 . . .	69.0 . . .	0.9 . . .	18.9

<sup>1</sup> See footnote, p. 93.

FARMING POPULATION IN 1880, 1890, AND 1900.<sup>1</sup>

	<i>Agricultural laborers</i>		<i>Farmers, planters and overseers</i>	
	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>
<b>UNITED STATES</b>				
1900 . .	3,747,668 . .	663,209 . . . .	5,367,169 . .	307,706
1890 . .	2,556,957 . .	447,104 . . . .	5,055,130 . .	226,427
1880 . .	2,788,976 . .	534,900 . . . .	4,172,049 . .	57,002
<b>NORTH ATLANTIC DIVISION</b>				
1900 . .	410,856 . .	3,827 . . . .	587,550 . .	30,019
1890 . .	353,580 . .	2,277 . . . .	671,429 . .	17,233
1880 . .	344,512 . .	1,372 . . . .	666,299 . .	3,041
<b>SOUTH ATLANTIC DIVISION</b>				
1900 . .	780,073 . .	267,518 . . . .	873,147 . .	66,657
1890 . .	613,407 . .	198,203 . . . .	773,834 . .	48,241
1880 . .	706,651 . .	244,615 . . . .	634,464 . .	18,808
<b>NORTH CENTRAL DIVISION</b>				
1900 . .	1,209,612 . .	13,531 . . . .	2,125,701 . .	84,656
1890 . .	772,455 . .	5,561 . . . .	2,191,542 . .	73,083
1880 . .	840,966 . .	4,133 . . . .	1,832,623 . .	10,678
<b>SOUTH CENTRAL DIVISION</b>				
1900 . .	1,189,470 . .	376,361 . . . .	1,565,384 . .	114,895
1890 . .	716,060 . .	240,477 . . . .	1,240,801 . .	82,333
1880 . .	849,170 . .	284,537 . . . .	936,274 . .	23,778
<b>WESTERN DIVISION</b>				
1900 . .	157,657 . .	1,972 . . . .	215,387 . .	11,479
1890 . .	101,455 . .	586 . . . .	177,524 . .	5,537
1880 . .	47,677 . .	243 . . . .	102,389 . .	697

<sup>1</sup> Twelfth Census, Population II, pp. 510 *et seq.*; Eleventh Census, Population II, pp. 306 *et seq.*; Tenth Census, Population, pp. 760 *et seq.*

**FARMING POPULATION IN THE SEVEN LEADING CEREAL,  
PRODUCING STATES, IN 1880, 1890 AND 1900.<sup>1</sup>**

	<i>Agricultural laborers</i>		<i>Farmers, planters and overseers</i>	
	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>
<b>SEVEN STATES</b>				
1900 . .	605,596 . .	6,822 . . . . .	1,022,123 . .	34,114
1890 . .	357,565 . .	2,329 . . . . .	1,057,665 . .	34,202
1880 . .	350,947 . .	1,618 . . . . .	824,362 . .	4,438
<b>ILLINOIS</b>				
1900 . .	183,272 . .	1,687 . . . . .	257,790 . .	10,159
1890 . .	125,137 . .	827 . . . . .	285,644 <sup>2</sup> . .	11,885
1880 . .	150,190 . .	717 . . . . .	279,423 . .	1,754
<b>IOWA</b>				
1900 . .	132,290 . .	1,160 . . . . .	227,482 . .	6,846
1890 . .	73,753 . .	403 . . . . .	236,338 . .	7,515
1880 . .	88,045 . .	354 . . . . .	210,928 . .	973
<b>KANSAS</b>				
1900 . .	88,462 . .	809 . . . . .	172,337 . .	5,682
1890 . .	47,965 . .	234 . . . . .	192,452 . .	6,387
1880 . .	54,725 . .	177 . . . . .	146,988 . .	643
<b>MINNESOTA</b>				
1900 . .	92,889 . .	1,306 . . . . .	152,094 . .	5,402
1890 . .	51,701 . .	457 . . . . .	130,607 . .	3,261
1880 . .	33,852 . .	141 . . . . .	96,128 . .	559
<b>NEBRASKA</b>				
1900 . .	58,760 . .	841 . . . . .	118,330 . .	3,245
1890 . .	34,596 . .	175 . . . . .	129,106 . .	3,186
1880 . .	18,848 . .	210 . . . . .	68,263 . .	400
<b>NORTH DAKOTA</b>				
1900 . .	23,774 . .	419 . . . . .	43,699 . .	1,312
1890 . .	12,157 . .	116 . . . . .	30,109 . .	691
1880 <sup>3</sup> . .	5,287 . .	19 . . . . .	22,632 . .	109
<b>SOUTH DAKOTA</b>				
1900 . .	26,149 . .	600 . . . . .	50,391 . .	1,468
1890 . .	12,256 . .	117 . . . . .	53,409 . .	1,277
1880 <sup>3</sup> . .	. .	. . . . .	. .	. .

<sup>1</sup> See footnote 1, page 99.

<sup>2</sup> Includes returns from South Dakota.

<sup>3</sup> Included in returns for North Dakota.

AGRICULTURAL POPULATION OF NEW ENGLAND IN 1880,  
1890, AND 1900. (CLASSIFICATION OF 1900).<sup>1</sup>

	Total	In Agriculture Male	Female
<b>NEW ENGLAND</b>			
1900 . . . . .	287,829 . . . . .	277,956 . . . . .	9,873
1890 . . . . .	304,448 . . . . .	299,835 . . . . .	4,613
1880 . . . . .	304,679 . . . . .	303,679 . . . . .	1,000
<b>CONNECTICUT</b>			
1900 . . . . .	44,796 . . . . .	43,247 . . . . .	1,549
1890 . . . . .	45,596 . . . . .	44,830 . . . . .	766
1880 . . . . .	44,274 . . . . .	44,184 . . . . .	90
<b>MASSACHUSETTS</b>			
1900 . . . . .	66,551 . . . . .	64,669 . . . . .	1,882
1890 . . . . .	69,720 . . . . .	68,790 . . . . .	930
1880 . . . . .	65,215 . . . . .	64,988 . . . . .	227
<b>MAINE</b>			
1900 . . . . .	76,923 . . . . .	73,791 . . . . .	3,132
1890 . . . . .	81,284 . . . . .	79,821 . . . . .	1,463
1880 . . . . .	83,437 . . . . .	83,194 . . . . .	243
<b>NEW HAMPSHIRE</b>			
1900 . . . . .	38,782 . . . . .	37,224 . . . . .	1,558
1890 . . . . .	42,279 . . . . .	41,658 . . . . .	621
1880 . . . . .	45,122 . . . . .	44,931 . . . . .	191
<b>RHODE ISLAND</b>			
1900 . . . . .	10,957 . . . . .	10,673 . . . . .	284
1890 . . . . .	11,630 . . . . .	11,446 . . . . .	184
1880 . . . . .	10,986 . . . . .	10,951 . . . . .	35
<b>VERMONT</b>			
1900 . . . . .	49,820 . . . . .	48,352 . . . . .	1,468
1890 . . . . .	53,939 . . . . .	53,290 . . . . .	649
1880 . . . . .	55,645 . . . . .	55,431 . . . . .	214

<sup>1</sup> Data for 1890 and 1900 taken from Report of Twelfth Census, Population II, pp. cxxxv-cxxxix. As to data for 1880 see footnote 1, p. 93.

ACREAGE IN ALL FARM CROPS,<sup>1</sup> AS REPORTED IN 1880,  
1890, AND 1900.<sup>2</sup>

	1900	1890	1880
<b>UNITED STATES</b>			
All Farm Crops . . .	272,493,449 . . .	214,623,412 . . .	164,830,442
Cereals . . . . .	184,983,220 . . .	140,378,857 . . .	118,805,952
Hay . . . . .	61,691,069 . . .	52,948,797 . . .	30,631,054
Cotton . . . . .	24,275,101 . . .	20,175,270 . . .	14,480,019
Cane . . . . .	386,986 . . .	374,975 . . .	227,776
Tobacco . . . . .	1,101,460 . . .	695,301 . . .	638,841
Hops . . . . .	55,613 . . .	50,212 . . .	46,800
<b>NORTH ATLANTIC DIVISION</b>			
All Farm Crops . . .	21,957,338 . . .	22,155,561 . . .	22,024,776
Cereals . . . . .	8,957,452 . . .	8,869,351 . . .	9,913,840
Hay . . . . .	12,919,041 . . .	13,205,321 . . .	12,026,364
Cotton . . . . .	. . .	. . .	. . .
Cane . . . . .	. . .	. . .	. . .
Tobacco . . . . .	53,281 . . .	44,080 . . .	44,852
Hops . . . . .	27,564 . . .	36,809 . . .	39,720
<b>SOUTH ATLANTIC DIVISION</b>			
All Farm Crops . . .	26,481,330 . . .	23,730,022 . . .	22,135,566
Cereals . . . . .	16,964,662 . . .	14,790,108 . . .	15,575,701
Hay . . . . .	2,161,201 . . .	1,925,753 . . .	1,128,420
Cotton . . . . .	6,842,489 . . .	6,746,292 . . .	5,165,175
Cane . . . . .	47,223 . . .	32,888 . . .	24,778
Tobacco . . . . .	465,754 . . .	234,981 . . .	241,480
Hops . . . . .	1 . . .	. . .	12
<b>NORTH CENTRAL DIVISION</b>			
All Farm Crops . . .	155,167,564 . . .	122,950,427 . . .	85,760,874
Cereals . . . . .	119,324,898 . . .	90,584,015 . . .	70,154,743
Hay . . . . .	35,676,042 . . .	32,220,468 . . .	15,490,866
Cotton . . . . .	45,749 . . .	57,991 . . .	32,116
Cane . . . . .	. . .	. . .	. . .
Tobacco . . . . .	120,516 . . .	86,789 . . .	78,038
Hops . . . . .	359 . . .	1,164 . . .	5,111

<sup>1</sup> By "all farm crops" is meant the following crops: Barley, buck-wheat, cane, corn, cotton, hay, hops, oats, rice, rye, tobacco, and wheat. These are all of the crops for which comparable data can be had and they constitute nearly the whole of the crop acreage. The only crops of any consequence, from the standpoint of acreage, and not included are: Broomcorn, flax, hemp, potatoes, vegetables, and orchard fruits.

<sup>2</sup> The data of hop acreage in 1879 and 1889 are taken from the Report of the Eleventh Census, Agriculture II, p. 91 *et seq.* All other data are taken from the Report of the Twelfth Census, Agriculture II, p. 63 *et seq.*

	1900	1890	1880
<b>SOUTH CENTRAL DIVISION</b>			
All Farm Crops . . .	53,593,467 . . .	36,178,553 . . .	29,744,199
Cereals . . . . .	31,521,429 . . .	20,222,568 . . .	19,350,718
Hay . . . . .	3,883,662 . . .	1,913,532 . . .	633,433
Cotton . . . . .	17,386,807 . . .	13,370,987 . . .	9,282,728
Cane . . . . .	339,708 . . .	342,087 . . .	202,998
Tobacco . . . . .	461,855 . . .	329,379 . . .	274,322
Hops . . . . .	6 . . .	. . .	. . .
<b>WESTERN DIVISION</b>			
All Farm Crops . . .	15,293,750 . . .	9,608,849 . . .	5,165,027
Cereals . . . . .	8,214,779 . . .	5,912,815 . . .	3,810,950
Hay . . . . .	7,051,123 . . .	3,683,723 . . .	1,351,971
Cotton . . . . .	56 . . .	. . .	. . .
Cane . . . . .	55 . . .	. . .	. . .
Tobacco . . . . .	54 . . .	72 . . .	149
Hops . . . . .	27,683 . . .	12,239 . . .	1,957





# INDEX

	PAGE
Average size of farms, 1850-1900 . . . . .	47
acreage of improved land per farm . . . . .	48
acreage in crops per farm . . . . .	49
acreage in crops per worker . . . . .	17
California, harvesting in . . . . .	9
Cereal and hay acreage in 1899 . . . . .	52
Corn crop of 1869 . . . . .	15
Corn cultivators introduced . . . . .	4 and 8
Corn shelling . . . . .	10
Cost of production . . . . .	23
Cotton gin invented . . . . .	6
Crop acreage in 1899 . . . . .	52
Crop products in 1839-1899 . . . . .	12
Displaced workmen, what becomes of . . . . .	40
"Farm crops", includes what . . . . .	102, note
Farm life, improved condition of . . . . .	69-75
Farm machinery, when introduced . . . . .	1
Farm products, value per person . . . . .	70
Farm work transferred to towns . . . . .	43
Farming in Georgia in colonial times . . . . .	3
Farms, influence of machinery on size of . . . . .	47
Fluctuations in supply of farm products . . . . .	27
Food supply per capita . . . . .	14, note
Labor, saving of . . . . .	29
displacement of . . . . .	30
absolute displacement of . . . . .	31
relative displacement of . . . . .	34
Laborers, dependent class, growth of . . . . .	55-56
Longevity in different occupation classes . . . . .	91
Mail, free delivery of . . . . .	71
Machinery, includes what . . . . .	20, note
output of farm machinery . . . . .	11
Census Office showing on effectiveness of . . . . .	16
as a "product making" device . . . . .	23
and quality of product . . . . .	28
and labor . . . . .	29
where most used . . . . .	53
and general welfare . . . . .	69
and illiteracy . . . . .	83
influence of on population . . . . .	76
and the length of the working day . . . . .	84
Occupation classes, shifting in . . . . .	37-38
growth of . . . . .	42

Plow, in colonial times . . . . .	4
Charles Newbold's cast iron plow . . . . .	6
Daniel Webster's stump plow . . . . .	5
Population and food supply . . . . .	13-14
Reaping machines, among the Gauls . . . . .	1
in the United States . . . . .	7, 9
Routine work . . . . .	78
Threshing, in colonial times . . . . .	2
in the United States about 1870 . . . . .	8
"Unskilled workmen" . . . . .	62 and note
Wages, daily . . . . .	60
monthly . . . . .	65
Wage rates, sympathetic variations in . . . . .	68
Webster and his plow . . . . .	5
Women's work on the farm . . . . .	74
Working-day, length of . . . . .	84

# PUBLICATIONS OF THE AMERICAN ECONOMIC ASSOCIATION

## VOLUME II, 1897

- Ninth Annual Meeting: Hand-Book and Report. Pp. 162. .50
1. Economics and Jurisprudence. By Henry C. Adams. Pp. 48. .50
  2. The Saloon Question in Chicago. By John E. George. Pp. 62. .50
  3. The General Property Tax in California. By Carl C. Plehn. Pp. 88. .50
  4. Area and Population of U. S. at Eleventh Census. By W. F. Willcox. Pp. 60. .50
  5. A Discussion Concerning the Currencies of the British Plantations in America, etc. By William Douglass. Edited by C. J. Bullock. Pp. 118. .50
  6. Density and Distribution of Population in U. S. at Eleventh Census. By W. F. Willcox. Pp. 79. .50

## VOLUME III, 1898

- Tenth Annual Meeting: Hand-Book and Report. Pp. 136. .50
1. Government by Injunction. By William H. Dunbar. Pp. 44. .50
  2. Economic Aspects of Railroad Receiverships. By H. H. Swain. Pp. 118. .50
  3. The Ohio Tax Inquisitor Law. By T. N. Carver. Pp. 50. .50
  4. The American Federation of Labor. By Morton A. Aldrich. Pp. 54. .50
  5. Housing of the Working People in Yonkers. By Ernest L. Bogart. Pp. 82. .50
  6. The State Purchase of Railways in Switzerland. By Horace Michelié; translated by John Cummings. Pp. 72. .50

## VOLUME IV, 1899

- Eleventh Annual Meeting: Hand-Book and Report. Pp. 126. .50
1. I. Economics and Politics. By A. T. Hadley. II. Report on Currency Reform. III. Report on the Twelfth Census. Pp. 70. .50
  2. Personal Competition. By Charles H. Cooley. Pp. 104. .50
  3. Economics as a School Study. By Frederick R. Clow. Pp. 72. .50
  - 4-5. The English Income Tax. By J. A. Hill. Pp. 162. 1.00
  - 6 (and last).\* The Effects of Recent Changes in Monetary Standards upon the Distribution of Wealth. By Francis S. Kinder. Pp. 91. .50

Price of the Economic Studies \$2.50 per volume in paper, \$3.00 in cloth. The set of four volumes, in cloth, \$10.00.

## NEW SERIES

1. The Cotton Industry. By M. B. Hammond. Pp. 494. (*In cloth \$2.00.*) \$1.50
  2. Scope and Method of the Twelfth Census. Critical discussion by over twenty statistical experts. Pp. 525. (*In cloth \$2.50.*) 2.00
- Both volumes, *in cloth*, \$4.00.

## THIRD SERIES

### VOLUME I, 1900

1. Twelfth Annual Meeting: Papers on Trusts (3); Railroad problems (3); Economic theory (3); Public finance (2); Consumers' league; Twelfth census. Pp. 286. 1.00
2. The End of Villainage in England. By T. W. Page. Pp. 99. 1.00
3. Essays in Colonial Finance. By members of the Association. Pp. 303. 1.50
4. Currency and Banking in the Province of the Massachusetts Bay. By A. McF. Davis. Part I: Currency. Pp. 484 + 19 photogravure plates. (*In cloth \$2.00.*) 1.75

### VOLUME II, 1901

1. Thirteenth Annual Meeting: Papers on Commercial education (3); Economic theory (3); Taxation of quasi-public corporations (2); Porto Rican finance; Municipal accounts. Pp. 300. 1.25
2. Currency and Banking. By A. McF. Davis. Part II: Banking. Pp. 341 + 18 photogravure plates. (*In cloth \$2.00.*) 1.75
3. Theory of Value before Adam Smith. By Hannah R. Sewall. Pp. 132. 1.00
4. Administration of City Finances in U. S. By Frederick R. Clow. Pp. 144. 1.00



# PUBLIC ATINS OF THE AMERICAN ECONOMIC ASSOCIATION

## VOLUME III, 1902

1. Fourteenth Annual Meeting: Papers on International trade (3); Industrial policy (2); Public finance (2); Negro problem; Arbitration of labor disputes; Economic history. Pp. 400. 1.50
2. The Negro in Africa and America. By Joseph A. Tillinghast. Pp. 240. 1.25  
(In cloth, \$1.50.)
3. Taxation in New Hampshire. By Maurice H. Robinson. Pp. 232. 1.25
4. Rent in Modern Economic Theory. By Alvin S. Johnson. Pp. 136. .75

## VOLUME IV, 1903

1. Fifteenth Annual Meeting: Papers on Trades Unions (4); Railway Regulation (2); Theory of Wages; Theory of Rent; Oriental Currency Problem; Economics and Social Progress. Pp. 298. 1.25
2. Ethnic Factors in the Population of Boston. By Frederick A. Bushee. Pp. 171, 1.00
3. History of Contract Labor in the Hawaiian Islands. By Katharine Coman. Pp. 74. .75
4. The Income Tax in the Commonwealths of the United States. By Delos O. Kinsman. Pp. 134. 1.00

## VOLUME V, 1904

- Sixteenth Annual Meeting. Papers and Proceedings published in two parts.
1. PART 1—Papers and Discussions on Southern Agricultural and Industrial Problems (7); Social Aspects of Economic Law; Relations Between Rent and Interest. Pp. 240. 1.00  
Southern Economic Problems—reprinted from part 1. .50  
Relations Between Rent and Interest. By Frank A. Fetter and others. Reprinted from part 1. .50
  2. PART 2—Papers and Discussions on The Management of the Surplus Reserve; Theory of Loan Credit in Relation to Corporation Economics; State Taxation of Interstate Commerce; Trusts; Theory of Social Causation. 1.00  
Theory of Social Causation. By Franklin H. Giddings and others—reprinted from part 2. .50
  3. Monopolistic Combinations in the German Coal Industry. By Francis Walker. Pp. 340. 1.25
  4. The Influence of Farm Machinery on Production and Labor. By Hadly Winfield Quintance. Pp. 110. .75

The entire Publications, 1886-1904, viz., first series, new series, Economic Studies, and third series, vols. 1-5, twenty-two volumes, in cloth, \$70.00. Special price to libraries on application. The supply of complete sets is now below fifty.

The price of the Third Series by volumes is the same as that of the first series; see above.

Cloth bound volumes will be sent, prepaid, to members, for 75 cents each, in exchange for unbound numbers, returned to the Secretary prepaid, and in good condition. Copies in half morocco are 50 cents per volume more than those in cloth.

Separate subscriptions by non-members, libraries, etc., \$4.00 per year. Any single monograph may be obtained at the price given above. One-sixth discount to members and subscribers on all orders.

The American Economic Association, founded, among other purposes, for "the encouragement of economic research," and "the encouragement of perfect freedom of economic discussion," has more than a thousand members, including public and professional men and most of the leading students of political economy in America. Membership dues are three dollars a year. Each member receives all current reports and publications of the Association.

Address applications for membership, subscriptions, and inquiries to the

SECRETARY of the AMERICAN  
ECONOMIC ASSOCIATION,  
Ithaca, N. Y.

Address all orders except subscriptions to the publishers,

THE MACMILLAN CO.,

66 Fifth Avenue, - - New York











This book should be returned to  
the Library on or before the last date  
stamped below.

A fine of five cents a day is incurred  
by retaining it beyond the specified  
time.

Please return promptly.



3 2044 105 213 391